American Journal of Public Health
and THE NATION'S HEALTH

Volume 38 October, 1948 Number 10

Recent Developments in the Treatment of Syphilis*

EVAN W. THOMAS, M.D.

Departments of Medicine and Dermatology and Syphilology, New York University College of Medicine and the Department of Medicine and Dermatology and Syphilology, Third Medical Division, Bellevue Hospital, New York, N. Y.

Values of Penicillin

The advent of penicillin, especially in its new slowly absorbed preparations, has greatly simplified the treatment of syphilis. All stages of the disease can now be treated in a relatively short time with better therapeutic results than formerly. Although penicillin is not a panacea for every case of syphilis, no previous antisyphilitic agent can compare with it in ease of administration, safety, and therapeutic effectiveness. An occasional patient may require the use of bismuth, arsenicals, or fever therapy, but most syphilitics can now be treated satisfactorily with penicillin alone.

At least 2 years of follow-up observations are required for the proper evaluation of any schedule of antisyphilitic treatment; and in spite of careful planning, the optimum time of penicillin treatment for early syphilis has not yet been thoroughly established. When the antibiotic first became available for antisyphilitic treatment in 1943, it was used in aqueous or saline solution. To insure reasonably continuous therapeutic action, individual injections had to be given every 2 to 6 hours, and patients had to be hospitalized. During the war, most cases of early syphilis were treated over periods of from 4 to 8 days, the great majority having been treated for 7½ days. We now have adequate information regarding the optimum total dosage of penicillin for the treatment of early syphilis within 8 days, but the data on more prolonged periods of treatment are still in the process of compilation. The time-dose relationships of therapy with aqueous solutions of penicillin are very different from those with slowly absorbed preparations. The introduction of penicillin in oil and beeswax (POB) made it possible to treat syphilis with single daily injections but most of the data on prolonged follow-up studies of patients treated for early syphilis with POB are on 8 day schedules of therapy. Furthermore, within the past few months, preparations of penicillin which are even more slowly absorbed than POB

* Special Review Article, prepared at the request of the Editorial Board.

Aided by grants from the U. S. Public Health Service.

have become available, with the result that a still wider range of possible time-dose relationships in the penicillin treatment of syphilis now exists. The data on penicillin treatment of syphilis are not yet sufficiently complete to give final conclusions about optimum schedules of therapy with the new preparations but we have sufficient information to prove the superiority of penicillin to previous antisyphilitic agents.

Review of Penicillin Preparations

Penicillin in aqueous or saline solution—The original penicillin used in the treatment of syphilis consisted of sodium, potassium, or calcium salts of amorphous penicillin which contained a high proportion of penicillin G. Subsequently, changes in the growth of the mold and the manufacture of amorphous penicillin resulted in products which contained larger amounts of penicillin K than G, and it was found that K was less effective in the treatment of both syphilis and gonorrhea than G. As crystalline penicillin G can now be manufactured in almost pure form, and as it is one of the most effective of the known penicillins, crystalline penicillin G has been used almost exclusively since the latter part of 1946.

In aqueous or saline solution, sodium, potassium, and calcium salts of penicillin are rapidly absorbed after injection and rapidly excreted. For continuous effect, individual injections of 20,000 to 80,000 units must be given every 2 to 4 hours. Most of the clinical research on the treatment of syphilis with aqueous solutions of penicillin was with individual injections every 3 hours, but many patients were also treated at 2, 4, and 6 hour intervals. When individual injections of 30,000 to 90,000 units were given, it made no significant difference in the treatment of early syphilis whether injections were given at 2 or 6 hour intervals, provided a total dose of at least 2.4 million units was used in a period of 7½ days. The minimum period during which penicillin must be active within the body for the cure of early syphilis in a fairly high percentage of cases seems to be about 4 days. By giving very large doses of penicillin in aqueous solution, the absorption and excretion can be appreciably delayed. Eagle and his coworkers[1] have cured early syphilis in rabbits by injecting very large amounts of penicillin in a single day, but the minimum total dose of penicillin necessary for the cure of 50 per cent of the rabbits is almost 200 times as great when treatment is confined to a single day as when it is extended to 4 or more days.

Mahoney and his coworkers of the Venereal Disease Research Laboratory at Marine Hospital, Staten Island, New York, have treated early syphilis with 200,000 units of penicillin in aqueous solution every 2 hours for 36 injections (a total of 7.2 million units in 3 days). No reports of the effectiveness of this treatment have been made as yet, but I am told that the results, so far, seem to be comparable to those obtained with a total dose of 2.4 million units over 7½ days. But, regardless of whether very large total doses are injected for 3 or 4 days or smaller doses are given over a longer period, the use of penicillin in aqueous solution requires frequent injections which makes it impossible to treat patients on an ambulatory basis.

Penicillin in oil and beeswax (POB)—When large particles (50 microns or more) of penicillin G are mixed with oil and 4.8 per cent beeswax, blood concentrations of penicillin can be demonstrated for 20 to 30 hours after a single injection of 300,000 units. The introduction of this preparation made it unnecessary to give individual injections more than once a day. Our experience at Bellevue Hospital indicates that, when total doses of from

2.4 to 4.8 million units of POB are used over a period of 8 days, single daily injections of from 300,000 to 600,000 units are as effective as smaller individual doses given more frequently, and the results of treatment are comparable to those obtained with similar total doses of penicillin in aqueous solution.

Procaine penicillin G in oil—In the early part of 1948 procaine penicillin G in oil became available for general use. Previous experiments had shown that various salts of penicillin can be manufactured which are more slowly absorbed than sodium, potassium, and calcium salts. Procaine penicillin, so far, has proved the most practical of the slowly absorbed salts. A single injection of 300,000 units of procaine penicillin G in oil gives demonstrable blood concentrations of penicillin for from 20 to 30 hours as does a similar dose of POB. Procaine penicillin in oil, however, has the advantage of being more easily administered than POB and, to date, it has given fewer local and generalized reactions.

Procaine penicillin G in oil and 2 per cent aluminum monostearate — Soon after the production of procaine penicillin G in oil, it was found that the absorption of penicillin could be still further delayed by adding aluminum monostearate to the penicillin-oil mixture. Aluminum monostearate is a water-repellent substance which coats the particles of penicillin and greatly delays absorption. When procaine penicillin G is mixed with oil, penicillin particles of 50 μ or over are needed for delayed absorption. When aluminum monostearate is added to the mixture, small particles of penicillin are absorbed even more slowly than large particles. At Bellevue Hospital and elsewhere, numerous different penicillin preparations were investigated in coöperation with the Bristol Laboratories.[2] Procaine penicillin in oil and 2 per cent aluminum monostearate was found to give the most prolonged blood concentrations. Following a single injection of 300,000 units of this preparation, demonstrable blood concentrations of the antibiotic were found for 4 days or more in about 90 per cent of 168 cases. Following injections of 1.2 to 2.4 million units, blood concentrations of penicillin were found for about 5 days in most cases; and in some instances penicillin was demonstrated in the blood for as long as 7 or 8 days after the injection.

Obviously the availability of penicillin preparations which are slowly absorbed for 4 to 7 days following a single injection still further simplifies the treatment of syphilis. High peaks of penicillin in the blood apparently mean very little in the treatment of syphilis. Many cases of early syphilis can be cured with little or no demonstrable blood concentrations of penicillin, provided there is fairly continuous action of penicillin over a sufficiently long period. Consequently, preparations which give continuous blood concentrations of the antibiotic for 4 or more days make it unnecessary to give daily injections, and possibly weekly injections of from 1.2 to 2.4 million units would suffice.

At present it is impossible to give data on the treatment of syphilis with procaine penicillin in oil and aluminum monostearate. Nevertheless it is reasonable to believe that the experience with aqueous solutions and POB can be used to estimate the time-dose relationships of treatment with preparations which give more prolonged absorption of penicillin.

RESULTS OF TREATMENT OF EARLY SYPHILIS WITH AQUEOUS SOLUTIONS OF PENICILLIN

Abundant data are now available to show that, when individual injections of penicillin in aqueous solution were

given every 2 to 4 hours over a period of 7½ days, a total dose of 2.4 million units has given as good results as 5 million units. Regardless of whether individual injections were given every 2 or 3 hours over a period of 7½ days, the results of treatment of early syphilis at Bellevue Hospital were the same whether the total dose was 2.4 million units or 4.8 million units. The addition of daily injections of 0.04 gm. arsenoxide for 8 days to total doses of from 1.2 million to 2.4 million units of penicillin failed to give significantly better therapeutic results than 2.4 million units alone in 7½ days.

The cumulative "failure" rates for all schedules of therapy of early syphilis with aqueous solutions of penicillin in total doses of from 2.4 to 4.8 million units in 7½ days have been about 20 per cent. The "failure" rates were computed on the basis of the number of patients kept under observation; the "failures" included all cases that had to be retreated because of reinfection, infectious relapse, serologic relapse, and definite seroresistance.

Failure rates of 20 per cent in the treatment of early syphilis are far from satisfactory, but many of the so-called failures were probably reinfections. Therefore, it is impossible to judge the effects of the treatment of early syphilis solely from statistics based on the retreatment of patients. The only satisfactory criterion of a reinfection following rapid treatment of early syphilis is the development of a new chancre at a different site from the original one, and even this criterion was not used in compiling cumulative "failure" rates following rapid treatment of early syphilis. Had it been used, the percentage of "failures" would be somewhat lower, but unfortunately patients can be reinfected following rapid treatment of early syphilis without developing a chancre. Less than 50 per cent of women who are originally infected with syphilis have chancres which are observed by the patient or examining physician. The appearance of secondary lesions may be the first observed sign of a reinfection in both women and men, and in some cases the only evidence of a reinfection may be a rise in the quantitative serologic tests for syphilis (serologic relapse). Thus, the actual effects of treatment with aqueous solutions of penicillin were undoubtedly better than the statistics indicate. Nevertheless, the treatment of early syphilis with aqueous solutions of penicillin over periods of from 4 to 8 days has not produced maximum therapeutic results, and we have no comparable data on more prolonged periods of therapy with aqueous solutions.

Results of Treatment of Early Syphilis with POB

Although injections of from 300,000 to 600,000 units of POB do not have to be given more frequently than once a day, the total dosage of penicillin required for the treatment of syphilis over a given period of time seems to have been much the same, whether the penicillin was given in aqueous solution or in oil and beeswax. At Bellevue Hospital in the latter part of 1945 and early months of 1946 we treated over 800 cases of early syphilis with 600,000 units of POB daily for 8 days. One series was treated with two injections of 300,000 units 8 hours apart each day, and another series with single daily injections of 600,000 units. There was no significant difference in the results of treatment in the two series. I have no personal experience with daily injections of only 300,000 units of POB in the treatment of early syphilis but the available data from other sources[3] indicate that the cumulative "failure" rates are much the same, whether a total dose of 2.4 or 4.8 million units is given over 8 days. In our series of patients treated for 8 days with 4.8 million units

of POB the cumulative "failure" rates for a follow-up period of 2 years or more are similar to those for 2.4 million units of penicillin in aqueous solution in 7½ days, viz., about 20 per cent.

Data on 15 day schedules of penicillin therapy for early syphilis cannot yet be compared satisfactorily with those on 8 day schedules because of the marked difference in the time of follow-up observations and the varying conditions under which patients were treated.

At Bellevue Hospital we began to treat early syphilis with daily injections of 600,000 units of POB for 15 days late in 1947. The series so treated is not entirely comparable with earlier series because the reservoir of infectious syphilis was appreciably lower in the latter part of 1947 and first half of 1948 than in the preceding 4 years. The chances of reinfection by promiscuous individuals is greater when the reservoir of infectious syphilis is high than when it is low.

But, in spite of uncontrollable variables, a 15 day schedule of therapy for early syphilis now seems superior to one of 8 days. At Bellevue Hospital, of 134 patients treated for early syphilis with 600,000 units of POB daily for 15 days and observed from 4 to 9 months, only 2 have had to be retreated and both of them were probably reinfected. It is quite possible that daily injections of 300,000 units of POB would have given similar results to 600,000 units daily. Chargin, Sobel, Rein, and Rosenthal [4] have reported relapses in less than 5 per cent of patients treated for secondary syphilis with 300,000 units of POB daily for 16 days after a follow-up period of from 6 to 10 months.

Possible Schedules of Treatment of Early Syphilis with Procaine Penicillin in Oil and Aluminum Monostearate

As single injections of 300,000 to 600,000 units of procaine penicillin G in oil and 2 per cent aluminum monostearate give blood concentrations of penicillin for about 4 days, daily injections of this preparation should be unnecessary in the treatment of syphilis. A Committee on Venereal Diseases of the National Institute of Health is now studying the treatment of early syphilis with the following schedules of therapy using procaine penicillin in oil and aluminum monostearate:

1. A single injection of 2.4 million units
2. Weekly injections of 1.2 million units for 2 weeks
3. Weekly injections of 1.2 million units for 4 weeks.

The use of schedule 1 should give results very similar to those obtained by injections of 40,000 units of penicillin in aqueous solution every 3 hours for 60 injections or of daily injections of 300,000 units of POB for 7 or 8 days. The advantages of treating early syphilis with a single treatment are so great from a public health point of view that this treatment should be given careful trial under controlled conditions, but it cannot be advised as yet. The optimum period of treatment for early syphilis now seems to be 15 or more days. Therefore, schedules 2 and 3 are likely to give better results than schedule 1.

Other possible schedules of treatment with procaine penicillin in oil and aluminum monostearate are injections of 600,000 units two or three times a week for 2 to 3 weeks. At least another 2 years or more will be required before we can state with assurance the optimum time during which penicillin should be given in the treatment of early syphilis but at present it does not seem likely that treatment need be given for more than 2 to 3 weeks.

Response of Serologic Tests for Syphilis Following Rapid Treatment of Early Syphilis

The goal of therapy in the treatment

of early syphilis is cure, with the achievement of seronegativity by all patients. Serologic tests for syphilis (STS), however, do not become negative immediately after treatment. In cases of seropositive primary syphilis about 80 per cent of those satisfactorily treated on our service became seronegative within six months after treatment and of those satisfactorily treated for secondary syphilis only about 60 per cent became seronegative within 6 months after treatment. The remaining 20 and 40 per cent respectively required varying periods before the STS became completely negative. Some patients had small amounts of reagin in the blood for more than 2 years after treatment, but in such cases the quantitative tests became relatively low within 6 months after treatment. The prolonged presence of small amounts of reagin in the blood for many months after treatment for early syphilis does not necessarily mean a continuing syphilitic infection because we found that retreatment did not hasten the reversal of such positive tests to negative and that in the course of time the STS became negative without further therapy unless a relapse occurred.

On our service we made the more or less arbitrary rule that patients who have positive Kahn tests in dilutions of 1–8 or quantitative complement-fixation tests of 15 or more, 9 months after treatment, should be retreated. Very few patients treated for early syphilis will have such relatively high quantitative STS 9 months after treatment unless they have relapsed. Relapse is detected either by the appearance of new early lesions or by marked, sustained rises in quantitative STS from previous levels.

Treatment of Relapsing Early Syphilis

At Bellevue Hospital the cumulative "failure" rates of patients retreated for "relapsing" early syphilis with at least 2.4 million units of penicillin in 8 days have been about 20 per cent. Many of these patients probably had reinfections rather than relapses. In cases of genuine relapse it is advisable to treat over a longer period than 8 days. A few of our patients had to be retreated two or three times for repeated relapses. But none as yet has failed to respond to penicillin, and we have no absolute failures in our entire series, provided repeated courses of penicillin were given. For a first relapse, patients should be retreated with no less than 6 million units of penicillin over a period of at least 15 days. Those who relapse a second time should receive 9 million units over a period of at least 21 days. Rarely it may be advisable to supplement the penicillin therapy with arsenicals and bismuth. In such cases, I believe the treatment with arsenicals and bismuth should be given after the course of penicillin has been completed. This procedure prolongs the therapy and may be more effective than combining the arsenicals and bismuth with penicillin therapy over a period of only 2 or 3 weeks.

Treatment of Late Neurosyphilis with Penicillin

Prior to the advent of penicillin, late neurosyphilis was one of the most difficult manifestations of syphilis to treat. Antisyphilitic therapy with heavy metals and arsenicals often checked a syphilitic infection of the central nervous system but it failed to arrest the process permanently in over 50 per cent of cases whether the disease was asymptomatic or symptomatic. In our experience at Bellevue Hospital, fever therapy (malaria or electropyrexia) caused permanent arrest of neurosyphilis, as determined by spinal fluid examinations, in about 85 per cent of cases and, so far, penicillin has proved superior even to fever therapy in the treatment of all

types of neurosyphilis, including general paresis.

During the first three years of trial with penicillin, some investigators [5–10] reported that fever therapy was superior to penicillin in the treatment of general paresis. They maintained that the best therapy was a combination of penicillin and fever. They based their conclusions on the clinical response of patients rather than on spinal fluid examinations. At Bellevue Hospital, Dattner and I [11] have long contended that the most reliable guide to the arrest of a syphilitic infection of the central nervous system is the spinal fluid examination. Following successful therapy, the cells in the spinal fluid should be less than 4 per cu. mm. 3 to 4 months after treatment, and there should be an appreciable fall in increased total protein determinations. Over a prolonged period of observation, the total protein determinations of the spinal fluid should fall to normal, and the colloidal gold and quantitative Wassermann tests should gradually become negative. In some of our malaria-treated cases the Wassermann reactions of the spinal fluid failed to become negative for more than 5 years after treatment but, as long as increased total protein determinations were falling and quantitative Wassermann and colloidal gold tests were declining toward negative reactions, we have not found that further antisyphilitic treatment helped to improve clinical symptoms and signs which are often caused by permanent damage in the central nervous system.

Most investigators [12–16] have now agreed that the response of the spinal fluid tests following penicillin therapy of neurosyphilis has been as good, if not better than, the response after fever therapy, and numerous authorities have stated that the clinical improvement after penicillin was comparable to that after fever therapy. In England, both Nicol [17] and Martin,[18] who have had much experience with malaria therapy of general paresis, have reported that penicillin was superior to fever therapy. Nicol says: "One of the most striking clinical features (of penicillin therapy in general paresis) was the physical and mental improvement in many patients."

It must always be recognized that no spirocheticidal agent can replace scar tissue with functioning parenchyma. Consequently, in cases of advanced neurosyphilis it is frequently impossible to restore normal function in spite of the total arrest of a syphilitic infection. Therefore, the spinal fluid tests furnish a better guide to the effectiveness of treatment of neurosyphilis than clinical signs and symptoms.

On the basis of follow-up spinal fluid examinations, 88.3 per cent of 301 patients treated at Bellevue Hospital for various types of neurosyphilis with penicillin alone and followed up for 9 to 48 months had satisfactory results after treatment with from 2 to 9 million units of penicillin given over a period of from 12 to 20 days. Most of the patients who had to be retreated received less than 6 million units of penicillin at the time of their first treatment. So far, only 1 patient has failed to respond satisfactorily after a second course of penicillin. Among the patients who had satisfactory results after penicillin therapy were 5 who had had much previous treatment with malaria therapy, bismuth, and pentavalent arsenicals. As we have observed over 500 patients treated at Bellevue Hospital for neurosyphilis with malaria and electropyrexia in previous years, I have no hesitancy in stating my belief that penicillin has proved superior to fever therapy in the treatment of neurosyphilis, including general paresis.

Schedules of penicillin therapy for neurosyphilis—From our experience at Bellevue Hospital, late neurosyphilis should be treated with no less than 6

million units of penicillin over a period of at least 15 days and preferably 3 weeks. Most of our patients were treated with 40,000 units of penicillin in aqueous solution every 3 hours for 150 injections (19 days). More recently, we have treated neurosyphilis with daily injections of 600,000 units of POB for 15 days. With the use of procaine penicillin in oil and aluminum monostearate, it is probable that injections of 600,000 units three times a week for 3 weeks will give comparable results to 40,000 units of penicillin in aqueous solution every 3 hours for 150 doses.

Treatment of Late Symptomatic Syphilis Other Than Neurosyphilis

The data on penicillin treatment of late symptomatic syphilis, other than neurosyphilis, are less abundant than on the treatment of early syphilis and neurosyphilis. Nevertheless, except for two reports,[19, 20] of gummas which failed to respond to penicillin, all types of late syphilis have responded well to penicillin therapy. Of 26 cases of late bone syphilis and cutaneous lesions treated at Bellevue Hospital with penicillin and observed for more than 2 years, all had satisfactory healing and none had relapsed.

To avoid Herxheimer reactions in cases of cardiovascular syphilis and syphilis of the liver, it is advisable to begin treatment with bismuth; but after several weeks of bismuth injections, the treatment can be completed with penicillin. Although the published reports of penicillin therapy of cardiovascular[21-24] and liver syphilis include relatively small series of patients, the results of treatment have been as satisfactory as could be expected.

Schedules of penicillin treatment of late symptomatic syphilis—From the data now available, late symptomatic syphilis, other than neurosyphilis, should be treated with from 4 to 6 million units of penicillin over a period of not less than fifteen days. If procaine penicillin G in oil and aluminum monostearate is used, injections of 600,000 units two or three times a week for 3 weeks should prove adequate therapy in most cases.

Treatment of Late Latent Syphilis

By definition, late latent syphilis is asymptomatic; it is diagnosed solely by history and positive STS. The spinal fluid must have been examined in all cases of latent syphilis and found to be normal before the diagnosis can be made.

As the STS do not become negative in most patients treated for late syphilis for many years after treatment, it is difficult to evaluate the effects of therapy in latent cases. Obviously, however, the kind and amount of antisyphilitic treatment which has proved effective in late symptomatic syphilis should be adequate for the treatment of late latent cases.

In the follow-up of patients treated for late latent syphilis quantitative STS should be obtained at regular intervals. As long as the quantitative tests show a gradual trend toward negative reactions or fail to show marked, sustained rises from previous levels, further antisyphilitic treatment is not advised. The policy of treating late syphilis, symptomatic or asymptomatic, until the STS have become completely negative cannot be too strongly condemned. At least 70 per cent of patients treated for late syphilis with any known form of antisyphilitic therapy will continue to have positive STS for more than 5 years after treatment, and some will continue to have positive STS for the rest of their lives. To treat patients for late syphilis with the sole purpose of reversing positive STS to negative is a serious error; it involves misrepresentation to the patient because there is

no evidence that continued antisyphilitic therapy will in any way hasten the reversal of positive STS to negative in well treated cases. Late latent syphilis can in most cases be satisfactorily treated with from 4 to 6 million units of penicillin over a period of 2 to 3 weeks.

CONCLUSIONS

1. Penicillin is now the antisyphilitic agent of choice for the treatment of all stages and types of syphilis.

2. So far, the best results in the treatment of early syphilis seem to have been obtained with daily injections of from 300,000 to 600,000 units of POB for 15 days.

3. Procaine penicillin G in oil and 2 per cent aluminum monostearate can now be substituted for POB, and individual injections of this preparation do not have to be given as frequently as with POB. Probably two injections of 600,000 units of this preparation a week for 2 or 3 weeks will accomplish as much as daily injections of 300,000 units of POB for 15 days.

4. Neurosyphilis should be treated with at least 6 million units of penicillin over a period of not less than 15 days and preferably 3 weeks. Injections of 600,000 units of procaine penicillin in oil and aluminum monostearate three times a week for 3 weeks should prove sufficient therapy for most cases of neurosyphilis.

5. For late symptomatic and late latent syphilis from 4 to 6 million units of penicillin should be given over a period of not less than 15 days.

6. In most cases of late syphilis, whether symptomatic or asymptomatic, it is impossible to reverse positive serologic tests for syphilis to negative within 5 or more years. Such patients should be observed after treatment with quantitative serologic tests at regular intervals. Marked rises in quantitative tests from previous levels, sustained for several weeks or months, are an indication for further therapy.

REFERENCES

1. Eagle, H., Magnuson, H. J., and Fleischman, R. The Effect of the Method of Administration on the Therapeutic Efficacy of Sodium Penicillin in Experimental Syphilis. *Bull. Johns Hopkins Hosp.*, 79:168, 1946.

2. Thomas, E. W., Lyons, R. H., Romansky, M. J., Rein, C. R., and Kitchen, D. K. Newer Repository Penicillin Products. *J.A.M.A.*, 137:1517, 1948.

3. Romansky, M. J. The Current Status of Calcium Penicillin in Beeswax and Peanut Oil. *Am. J. Med.*, 1:395, 1946.

Heller, J. R., Jr., Bowman, R. W., and Price, E. V. Rapid Treatment of Early Syphilis: Progress Report, December, 1947. *Ven. Dis. Inform.*, 29:103, 1948.

4. Chargin, L., Sobel, N., Rein, C. R., and Rosenthal, T. The Treatment of Early Syphilis with 300,000 Units of Crystalline Penicillin G in Peanut Oil and Beeswax (POB) for 16 Consecutive Days. (In Press.)

5. Gilpin, S. F. Neurosyphilis. In *Progress of Neurol. and Psychiat.* Vol 2, 1947, p. 282.

6. Heyman, A. Treatment of Syphilis of the Central Nervous System with Penicillin. *Am. J. M. Sc.*, 213:661, 1947.

7. Leavitt, H. M. Neurosyphilis. *Arch. Derm. & Syph.*, 56:233, 1947.

8. O'Leary, P. A., Brunsting, L. A., and Ockerly, O. Penicillin in the Treatment of Neurosyphilis. *J.A.M.A.*, 130:698, 1946.

9. Rose, A. S., and Solomon, H. C. Neurosyphilis. *Am. J. Psychiat.*, 103:524, 1947.

10. Solomon, H. C. Penicillin in Neurology and Psychiatry. *Dig. Neurol. & Psychiat.*, 14:132, 1946.

11. Dattner, B., and Thomas, E. W. The Management of Neurosyphilis. *Am. J. Syph., Gonor. & Ven. Dis.*, 26:21, 1942.

12. Callaway, J. L., Noojin, R. O., Flower, A. H., Jr., Kuhn, B. H., and Riley, K. A. The Use of Penicillin in the Treatment of Syphilis of the Central Nervous System. *Am. J. Syph., Gonor. & Ven. Dis.*, 30:110, 1946.

13. Dattner, B. Neurosyphilis and the Latest Methods of Treatment. *Med. Clin. of North America*, 32:107, 1948.

14. Gammon, G. D., Stokes, J. H., Steiger, H. P., Steele, W. H., Beerman, H., Ingraham, N. R., Jr., Gyorgy, P., Rose, E., Lentz, J. W., Ornstein, A., and Scott, D. Penicillin Therapy Alone in Neurosyphilis. *Ann. Int. Med.*, 25:412, 1946.

15. Koteen, H., Doty, E. J., Webster, B., and McDermott, W. Penicillin Therapy in Neurosyphilis. *Am. J. Syph., Gonor. & Ven. Dis.*, 31:1, 1942.

16. Scully, J. P., Falk, M. S., and Stokes, J. H. The Serologic Response in Penicillin-Treated Symptomatic Neurosyphilis. *Am. J. Syph., Gonor. & Ven. Dis.*, 32:224, 1948.

17. Nicol, W. D. Penicillin in Neurology. *Brit. M. J.*, May 24, 1947.

18. Martin, J. P. The Treatment of Neurosyphilis with Penicillin. *Brit. M. J.*, 1:922, 1948.

19. Hahn, R. D. Late Gummatous Syphilis Resistant to Treatment with Penicillin. Case Report, *Am. J. Syph., Gonor. & Ven. Dis.*, 31:542, 1947.

20. Hill, W. R. Problems Arising in Treatment of Syphilis with Penicillin. *New England J. Med.*, 235: 919, 1946.

21. Dolkart, R. E., and Schwenlein, G. X. The Treatment of Cardiovascular Syphilis with Penicillin. *J.A.M.A.*, 129:515, 1945.

22. Flaum, G., and Thomas, E. W. Penicillin Therapy of Cardiovascular Syphilis. *Am. Heart J.* (In Press.)

23. Russek, H. J., Cutler, J. C., Fromer, S. A., and Zohman, B. L. Treatment of Cardiovascular Syphilis with Penicillin. *Ann. Int. Med.*, 25:957, 1946.

24. Tucker, H. A., and Farmer, T. W. Penicillin in Cardiovascular Syphilis. *Arch. Int. Med.*, 80:322, 1947.

Some Unmet Needs in Tuberculosis Control—A Challenge for the Future*

WILLIAM P. SHEPARD, M.D., F.A.P.H.A.
Third Vice-President, Metropolitan Life Insurance Company, Past President, National Tuberculosis Association, San Francisco, Calif.

THERE appear to be three major unmet needs in tuberculosis control: capital, greater skill, and broader vision.

I. CAPITAL

I wish to speak first of the need for capital, not just money, not donations, not increased budget, but capital for an investment which promises good returns.

Dr. Florence R. Sabin, retiring President of the Western Branch, American Public Health Association, is the latest of our great public health leaders to suggest that the economic aspects of public health work have been insufficiently stressed. Humanitarians as they are, public health workers have been overwhelmed with the enormous human values of saving life and preventing illness. They sometimes forget the money values. We must depend on more or less hardheaded businessmen to support our work. Perhaps it is time we ceased thinking of ourselves as mendicants and assumed the role of investment counselors.

Today in public health and especially in tuberculosis control we have good methods, tested and proved effective over the years; we have professional competence, both administrative and medical; we have organizational competence attested by our results. We have skilled services to offer which will bring rich returns, both humanitarian and financial. These are items worth buying.

Good Health Is Good Business

Using a recent report of the National Planning Association under the title, *Good Health Is Good Business,* Dr. Sabin [1, 2] has illustrated how the economic aspect of public health may be used to good advantage in our search for capital. I will not repeat all of her figures which will be published soon, or go into detail concerning their derivation. Just let me recite certain high points to illustrate the method.

It is estimated that this country spent about $174,000,000 in 1943 for the care and control of tuberculosis. When the tuberculosis death rate becomes about one-fourth of its present figure, that is, about 10 per 100,000 per year this expenditure can be reduced to about $37,000,000, a saving of $137,000,000, a year. The death rate of 10 per 100,000 will be reached between 20 and 25 years from now at the present rate of decline. It is a reasonable assumption that this time could be speeded up if we greatly increased present effort and expenditure. In fact, some think the death rate might be reduced by three-fourths in 10 years.

In addition to the $174,000,000 we spent in 1943 for the care and control of tuberculosis, we lost in that year $348,000,000 worth of goods and services which could have been produced by those now disabled with tuberculosis.

* Presented at the Forty-fourth Annual Meeting, National Tuberculosis Association, New York, N. Y., June 18, 1948.

It is estimated by the National Planning Association that this amount could be reduced to $35,000,000, a saving of $313,000,000 a year.

Over and above these staggering amounts, we lost $229,000,000 in 1943 in the future net earnings of male heads of families who died of tuberculosis that year. It is estimated that this could be reduced to $22,000,000 a year, a saving of $207,000,000.

Are we not justified in asking Mr. United States, Incorporated, if he wishes to save the sum total of these amounts; namely, $657,000,000 a year?

How Much Would It Cost?

Mr. United States, Incorporated, is bound to be interested as would any businessman. His first question is, "How much will it cost?" This, too, is roughly estimated by the National Planning Association as follows:

If in the next 10 years we were to x-ray every inhabitant of this country aged 15 and over twice; follow up all suspects thus found with standard x-rays and complete examinations; follow up all contacts thus found with x-rays and careful examinations, the total cost would be about $13,560,000 a year.

The National Planning Association estimates the cost of hospital and medical care for the 133,000 patients hospitalized at $173,000,000 a year.

They estimate the cost of health education over this period as $12,000,000 a year.

The cost of rehabilitation would come to something like $22,000,000 a year.

The cost of family relief for the afflicted wage earners would come to something like $58,000,000 a year.

It is also estimated that $3,000,000 a year is needed for medical research.

Pensions for tuberculous veterans are assumed to continue at their present rate of $38,000,000 a year during the 10 years.

The cost of constructing new beds for areas now inadequately supplied is estimated at $377,750,000 but these facilities would be worth about $310,000,000 at the end of 10 years, when they might be turned over to other uses, leaving a net cost of about $6,800,000 a year for a period of 10 years for hospital construction. There are a few other miscellaneous items.

Altogether the National Planning Association estimates that it would cost about $328,000,000 a year for 10 years to reduce the tuberculosis death rate to something like a fourth of its present level. After that the cost would be reduced to approximately $37,000,000 a year, much of which would go for research. That is the prospectus for Mr. United States, Incorporated, investor: spending $328,000,000 to save $657,000,000. A 10 per cent return in 10 years would be a good investment. This offers a 200 per cent return!

Perhaps the time has come to present this whole matter to the nation as a good business proposition. We may as well face the costs squarely even though they seem astronomical to us. The return can be estimated with some accuracy and Mr. United States, Incorporated, cannot lose.

We may well stress the fact that this type of investment is different from most other expenditures of public funds. For example, expenditures for the police department have only an indirect effect on crime prevention, one much less tangible. Expenditures for fire departments do result in a little more tangible results in fire prevention, but no more tangible than ours. As for hospital expenditures, there is no end to the plea of hospital superintendents for more and better hospitals. Similarly with relief expenditures, we never have enough. The expenditure which we propose, large as it seems to us, is self-limited. Once completed, it will save in one year twice what it cost each year!

This, then, illustrates our need for capital and suggests a method by which the search for an investor may be approached. The figures presented here may not be exact, but the principle of investing a certain amount for a good return is sound. We may not have, at this moment, all the facilities needed in the way of personnel, but given the funds we can soon get them. Mr. United States, Incorporated, may well be interested both as a taxpayer and a purchaser of Christmas Seals.

II. GREATER SKILL

We already have much skill and much knowledge in public health matters and especially in tuberculosis control. We have had almost a half century of experience. We have a smooth working organization internally and externally. Relations were never better within our own organization and with our various state and local organizations. We have proved our adaptability to change.[3] We are prepared for the future, whatever may be the developments in a preventive vaccine or an antibiotic for the cure of tuberculosis. We now have the best case finding device yet found in the mass miniature x-ray. We can well be proud of our good results and our outstanding success over the years.

In our field, however, the best is none too good. We cannot be satisfied with anything short of perfection. Public health workers have always been characterized by their interest in evaluating and appraising their work. They find out how well or how ill they are doing, even if it hurts. Few social movements have been more constructively critical of their own methods. We have learned over the years to do things because they work, and to drop things that do not work. This is one of the major reasons for our great strength today and for the gratifying public support accorded us.

In our search for even better methods we must keep certain questions constantly before us. They need not be detailed here, but they include such things as these:

Some Suggestions for Self-Appraisal

Are you using modern methods of health education, or being satisfied with publicity alone? Are you reaching as many groups as you should, especially special racial groups among whom the tuberculosis rate is high? Are you spending as much on special racial groups as their needs justify?

Does your mass x-ray program include careful preliminary educational preparation and follow-up? Is it carefully integrated with and supported by the health department, county medical society, affected industries, and all existing community group leaders?

Is your health department adequately staffed and financed for modern tuberculosis control? If not, what are the reasons and what are you doing about it? Are you familiar with your state and local health department needs in general and exerting every effort to supply these needs through proper legislation and appropriation, bearing in mind that no voluntary agency can control tuberculosis adequately in the absence of a strong health department? Are you aware of your community's overall health needs, beyond tuberculosis control, and actively participating with the health council or other community-wide agency to supply these needs?

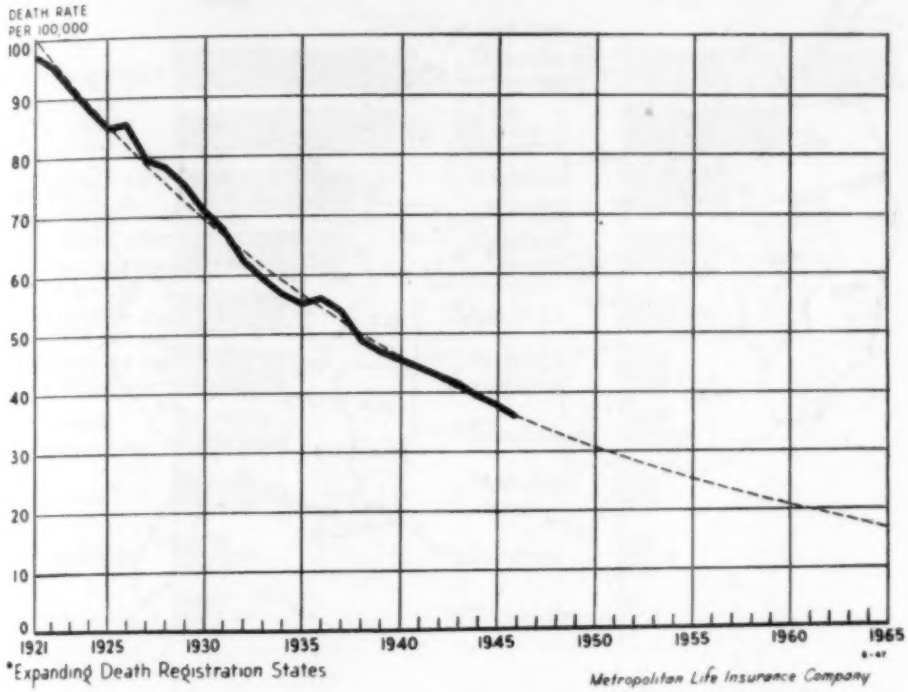
Are your practising physicians aware that each and every one of their offices is a case finding center, and does each of them know what community facilities are available for the detection of tuberculosis and the safeguarding of the well?

Is your sanatorium efficiently operated as evidenced by prompt admission, low per cent of recalcitrant patients, high per cent of early cases and cures, reasonable costs? Have you sufficient beds for newly discovered cases?

Do you periodically seek the counsel

CHART 1

DECLINE IN TUBERCULOSIS MORTALITY IN THE UNITED STATES* SINCE 1921



of the National Tuberculosis Association to see what their experience has been with your problems, most of which are common to all associations?

These are but a few of the items of self-appraisal necessary to greater efficiency. Others are available from the Gunn-Platt report,[4] or from the National Tuberculosis Association.

III. BROADER VISION

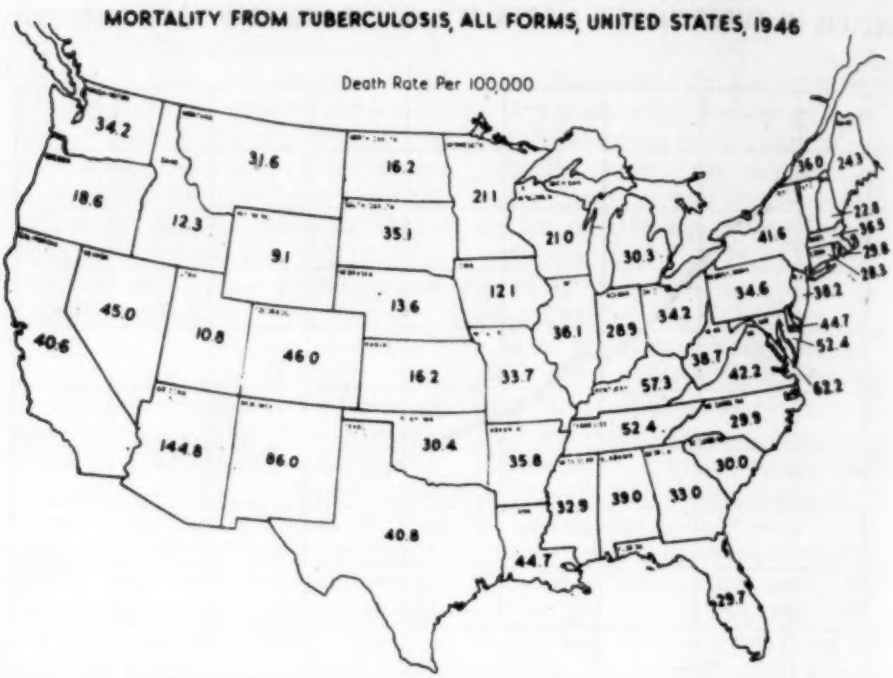
Broader vision is our final major need. We have already spoken of our mendicant attitude. To this, perhaps, should be added myopia. The time has come to look farther ahead.

Mortality Trend

As we look at Chart 1[5] we see one of the most astounding socio-biological phenomena of man's history. It is not new, but it helps myopia. This chart happens to go back only to 1921, but it shows our experience with the tuberculosis death rate per 100,000 population for the past 25 years. If it went back 75 years more, it would show approximately the same steady downward trend. Note where the trend line finishes in the year 1965 when tuberculosis mortality in this country will be less than 20 per 100,000 per year. Already it is below 40. If this trend continues, the death rate will be less than 10 in from 20 to 25 years.

The matter is even more urgent. If you will look at Chart 2[6] where 1946 death rates by state are displayed, you will see that the national death rate is heavily weighted by a few states at the top of the list whose rate is excessive. Actually, there are already 35 states out

CHART 2



of the 48 having death rates below 40 per 100,000 population. There are 17 states having death rates below 30, and 8 states having death rates below 20. Indeed, tuberculosis is already a very minor cause of death in Nebraska, Idaho, Iowa, Utah, and Wyoming, where it kills fewer than 15 per 100,000 per year.

Chart 3 [7] shows what we mean by minor causes of death. Note the enormous death rates from heart disease and cancer as compared with tuberculosis even today. Where will the tuberculosis rate be in 10, 20, and 40 years from now? Where will the National Tuberculosis Association be 20 and 40 years from now?

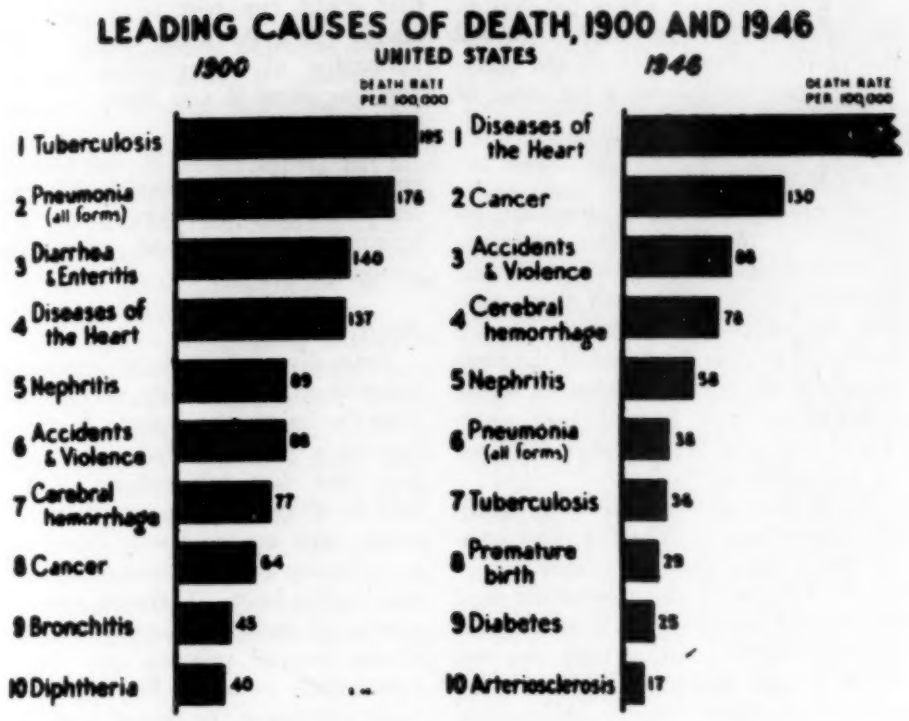
We, of the National Tuberculosis Association, have been told before that 3 choices confront us: liquidate, curtail, or expand.[8] Before deciding this question, let us take a quick review of our assets again and then look at our liabilities.

Shall We Liquidate These Assets?

Among the assets we have some 3,000 local associations. They have about 50,000 board members. We employ about 1,500 trained workers on a full-time basis, many of them with years of experience, well trained by that experience and by academic qualifications, their competence improving daily. There are at least 250,000 people in this country who are in some way connected with the tuberculosis control movement in a voluntary capacity, donating varying amounts of their valuable time, doing it for the cause, not for personal gain.

We have knowledge of community organization, of health education, and public health administration. We have experience and some skill in influencing

CHART 3



legislation in the right direction and in obtaining appropriations where it seems reasonable to ask the taxpayer to support portions of the tuberculosis control work. We have learned the proper role of the voluntary agency in relation to the tax-supported agency and in relation to other agencies in various health fields. We have shown our adaptability by changing direction as new scientific developments appear. We have outstanding public support and a fund raising device which is unparalleled. As workers in the public health field we have full knowledge of the proper use of the various specialists in this field; such as nurses, statisticians, health educators, physicians, and so forth.

Can We Liquidate These Liabilities?

Among our liabilities we have already spoken of lack of capital and our desire for even greater skill. The only other serious liability is our past failure to recognize 3 facts:

1. We have never controlled tuberculosis without attention to the general health needs of the community. We have always worked with health departments, with schools, with the problems of nutrition, health habits, need for medical care and hospitalization, the special aspects of industrial health, the importance of medical education, and the great importance of research.

2. We do health education, not solely tuberculosis education.

3. We can rather easily turn our skills to other fields, once tuberculosis control is well in hand.

Altogether we appear to be a healthy, going concern. Assets far outweigh liabilities. There is still great need for our services. Liquidation and curtailment are out of the question. Our only choice is to expand.

Exploring the Possibilities of Expansion

In what direction might the N.T.A. logically consider expansion? Time will not permit discussion of all the possibilities, but the following are some of the most intriguing:

Local Health Councils

We are beginning to realize that, regardless of the headquarters structure of the national health agencies and their interrelationships with each other, they flourish only by rendering service locally. They are the flower of the roots arising in the grass—a lesson we in the tuberculosis field learned long since. These roots only flourish when fertilized by local service.[9]

Each community has its own health problems, many of them like other communities, a few of them unique.

The solution of these problems must be reached locally by local people, not by imposing a program from the top. Local groups dedicated to the solution of health problems must be autonomous.

Because of these conditions, and thanks to the pioneering of a few well established local health councils, many such councils are being formed with surprising rapidity throughout the country. They consist of representatives of all health agencies, both official and voluntary, in a given community and are dedicated to the study and solution of all community health problems. With increasing frequency they seek expert advice from the national agencies, sometimes on social hygiene, again on tuberculosis, again on cancer, and so forth.

In many places the local tuberculosis association is virtually a health council, or at least is in a key position to activate and implement one already existing. It has been a valuable experience for our local tuberculosis associations to learn to facilitate their coöperation with other health agencies. We are learning, as are other members of these local health councils, that credit for an accomplishment is a secondary matter and that credit can best be shared with many. Paul de Kruif quotes J. W. Livingston as saying, "You can get anything done if you don't care who gets the credit."

Active participation in, and financial and moral support of, local health councils would seem a modern, proper, and legitimate use of our funds and personnel.

Heart Disease

Heart disease is more important than tuberculosis economically, socially, and from the health standpoint. It already imposes a greater burden on our populace than does tuberculosis. It is a field in which we have a legitimate interest since we can hardly examine or x-ray human chests without at least considering the heart. There are a striking number of similarities between the heart disease control program and that of tuberculosis control. These are especially startling in the field of acute rheumatic fever, now a leading killer among children.[10] In several localities and in some states we already have a good start toward combining the tuberculosis and heart disease control movements. This, too, would seem a legitimate and proper way to direct our energies.

Chronic Illness

If we segregate the entire problem of chronic illness, including as it does heart disease and tuberculosis, we are appalled at its size and seriousness. It is an enormous burden which grows heavier as the population ages. Little is being done about it. It is a field with which we are not unfamiliar, since tuberculosis is usually a chronic disease. The recently published joint statement on "Planning for the Chronically Ill," issued by the American Hospital Association, the American Public Welfare Association, the American Public Health Association, and the American Medical

Association,[11] is well worth careful study. It points out the need for more institutional care, a field in which we are well versed. Incidentally, it presents the possibility of using tuberculosis sanatoria when they are virtually empty in the not too distant future, for the care of the chronically ill. The report points out the need for more medical care, a field in which we have been blessed by the whole-hearted coöperation of the medical profession for many years.

The report says there is a hopeful side to the problem of the chronically ill in the field of rehabilitation; again, a field in which we have had considerable experience. There is great need for more home nursing care. We know where to get and how to use public health nurses. Altogether, this field of chronic illness looks like a great and impressive challenge and one in which we are not inexperienced or without skill.

Maternal and Child Health

Since the demise of the American Child Health Association in 1935, there has been no great national organization prepared to render service through local affiliates in the field of maternal and child health. The recent nation-wide study of child care facilities made by the American Academy of Pediatrics discloses surprising deficiencies in this nation's care of its children.[12] The infant and maternal death rates are still distressingly high in many places, and in the very places where modern medical and hospital care are lacking. It will take all the power of an aroused and informed public to remedy these deficiencies. Again, we have experience and ability in helping localities discern and remedy their health problems, and in working with organized medicine. The Academy of Pediatrics will need some such support as ours if results are to be obtained with a minimum of delay.

School Health

With but few exceptions, the school health field remains in a distressing state. Relatively few schools have sufficient numbers of school physicians, nurses, and teacher-health-specialists to do more than a token job of what we know how to do. Physical defects, many of them correctable, are overlooked or neglected in an appalling number of school children. We have learned from the Astoria studies and a few other places how to do effective health work in schools. We have the support of the education profession. We are lacking in public health personnel which is specially trained for school work.

Tuberculosis associations have had a long and fruitful partnership with the schools. We have often subsidized school nurses and physicians. We are accustomed to dealing with boards of education. We know how to prepare good health teaching material. This challenge might well engage us.

Personnel Training and Placement

The public health progress of the nation is seriously impeded by lack of competent personnel. In no area is this more apparent than among the voluntary health agencies. We have the oldest and best organized personnel training and placement program of any of the national voluntary health organizations. We have been giving in-service training for years. We have recruited, trained, placed, and replaced competent personnel for our locals. We are in touch with the accredited schools of public health and know how best to use them to supplement our needs. If we did nothing else new but to further develop our personnel training facilities for ourselves and the other health agencies, we would render a great service.

Other Special Problems

I need not go further than to leave

these few illustrations of some directions in which we might turn our attention. Others are the field of cancer control, of mental hygiene, and diabetes. In each of these we bring some special skill and meet a challenge worthy of our mettle.

Fund Raising and Interrelationships

It is at the point of fund raising and the interrelationships of various agencies that our best plans are likely to fail. With our great propensity in this country for voluntary organization we often over-organize to the detriment of the cause to which we are dedicated. Disagreements over internal administration, fierce interorganizational jealousies, complications, overlapping, and duplication unfortunately occur. Thus, sometimes we see the absurd spectacle of the individual suffering needlessly while the experts argue over which is to help and how.

Let us start by looking at the average town or city and the average individuals in it. It is safe to assume that this average "Midtown" needs good sanitation, tuberculosis control, venereal disease control, cancer deaths reduced, something done about heart disease, all the protection there is from polio, modern facilities for mental hygiene, prevention of blindness, prevention of deafness, and so forth. It is also safe to assume that much the same people are laboring to meet these needs in each of these average "Midtowns." They are the public spirited, generous, socially minded people who are your board members or someone else's, or who work for the Community Chest, or the League of Women Voters, or the Parent-Teacher Association. It is also pretty much these same people who do the fund raising, first for one cause, then the other.

It is on fund raising for so many worthy causes that they weary. They are justly entitled to relief. We must spare their energies and conserve their interest. There has been some thought that we might be able to finance the national voluntary health agencies in a combined or federated fund raising drive similar to that of the War Chest. I do not believe this can be done at present.

It is the inalienable right of the free American citizen to give to whomever he pleases and for whatever purpose interests him. One will give generously to tuberculosis because of personal experience. Another is more concerned with cancer or diabetes or heart disease. The reasons for each one are his own and he is entitled to them. He is not interested in a nebulous, anonymous cause called public health. Therefore, he will be less generous with any plan of federated fund raising except when it can be placed under one great cause, such as the War Chest. The experience of the Community Chests has proved this. They have, on the whole, collected less in their communities than would have been collected by each agency separately with separate fund raising drives.

To be sure, the individual donor may be annoyed with multiple drives, but so is he annoyed with the rival advertising claims of the virtues of 20 different automobiles, or soaps, or cereals. Nevertheless, he enjoys the freedom to choose his own brand of car. He takes greater pride in it because he picks it. So it is with his donations. Annoyed though he may be, it is his birthright in a democracy to make a free choice. Our job is telling him frankly what is needed, why, what his dollar will do, and keeping him informed on what his past dollars have done. He is also entitled to know that we use his money economically and with the greatest possible efficiency.

Is it too much to anticipate that the time may come when:

1. Tuberculosis associations will have the Great White Plague practically conquered, though continuing to hold the fort through permanent application of control measures and ever more generous support of research.

2. Tuberculosis associations will be playing a leading role in local health councils throughout the country, both financially and in terms of service. In some places they may actually become local health councils by having expert medical advice on various health problems other than tuberculosis and special board committees on such problems. In other places they may become the major financial and staff support of existing health councils.

3. Tuberculosis associations will be changed to tuberculosis and health associations and tell the public frankly what they are doing in the other challenging fields of public health.

4. Christmas Seals will be offered as usual, but for various purposes, and other appeals made to the same mailing list during the year, now for one purpose and again for another.

5. We say to the public something like this, "You have helped us conquer tuberculosis through your generous support over the years. It could easily become a great menace again, hence we need your continued support to hold our gain.

"The lessons we have learned and the skill we have developed in tuberculosis control can now be turned partly to other fields where the need is great.

"Please send the amount you would like us to devote to tuberculosis now. Later in the year we will give you an opportunity to help us with heart disease control (or cancer, diabetes, etc.)."

The amount sought and its proposed use will depend upon *local* needs, discerned by *local* people, and used *locally* except for a reasonable percentage for the particular national agency whose services are needed. The amount sought will not be a "quota" demanded by a national agency. Its use will be for a program constructed locally, not "imposed" by the national. The local agency will be wise to consult the national in order to take full advantage of its expert knowledge and broad experience. Thus, the national earns its percentage by rendering local service.

Is this too much to hope for? With our 50 year record of success in community health leadership, I do not believe it is.

Such a plan need not affect the existing structure of the national health agencies. They should be supported by a modest percentage of local funds collected, just as the National Tuberculosis Association is supported. They would continue to explore, develop and implement the best possible methods in their fields and be ready to offer them to local units as requested. Their experts would be available to locals at any time. They would continue studies of the overall national health problems and continue to integrate their work with the national government agencies. Their fund raising would be confined to the large donors, corporations, and individuals who wish their money used nationally. Finally, they would integrate their work with each other more closely through the National Health Council, just as we shall all soon be doing through local health councils.

There is a continuing need for various independent national health agencies, with separate fund raising campaigns, though closely coördinated through the National Health Council.

On the local basis, there is logic and economy in a single voluntary health organization, either a local health council with branches, or a tuberculosis and health association with committees of the board and divisions of the staff covering various fields. Incidentally, diagrams of such a plan were worked out for the National Health Council by Armstrong in 1921 and 1922 and encouraged by Dr. Linsley Williams, then Managing Director of the National Tuberculosis Association.

IV. SUMMARY

The future never presented more important challenges. Our unmet needs may be classified under Capital, Greater Skill, Broader Vision. Capital will be forthcoming as our work becomes better recognized as a good investment and as we develop courageous business methods. Greater Skill is inevitable with continued self-appraisal and sharing of experience. Broader Vision is urgent since it will lead to greater service, better health, and prolonged lives for all.

There is no thought of abandoning

tuberculosis control. We know this adversary well enough to realize that it will threaten us again in war or famine. We are strong enough now, however, to hold our tuberculosis gains while we attack new enemies which are destroying our people.

REFERENCES

1. Sabin, F. Presidential Address, Western Branch, A.P.H.A., Salt Lake City, May 25, 1948. In Press.
2. Good Health is Good Business. *Planning Pamphlet No. 62*, Joint Subcommittee on Health, Agriculture, Business and Labor, National Planning Association, 800 21 Street, N. W., Washington, D. C., Feb., 1948.
3. Shepard, W. P. Steady Does It. *Trans. of the 43rd Annual Meeting of the NTA, 1947.*
4. Gunn, S. M., and Platt, P. S. *Voluntary Health Agencies*—An Interpretative Study. The Ronald Press Company, N. Y., Second Printing, Mar., 1946.
5. Leading Causes of Death, 1900 and 1946, United States, MLI Co. *Stat. Bull.*, 29:4 (Apr.), 1948, p. 2.
6. Decline in Tuberculosis Mortality in the United States since 1921. MLI Co. *Stat. Bull.*, 28:11 (Nov.), 1947, p. 2.
7. Mortality from Tuberculosis (All Forms), United States, 1946. Map prepared by MLI Co. Statistical Bureau, June, 1948.
8. Shepard, W. P. Tomorrow's Tuberculosis Associations. *Am. Rev. Tuber.*, I, 3:244–250. (Sept.), 1944.
9. Shepard, W. P. Memorandum to the National Health Council, Aug., 1946. Personal Communication.
10. Wheatley, G. M. Can Rheumatic Fever be Attacked by Applying Knowledge Gained in Fighting Tuberculosis? New Jersey: Passaic County Tuberculosis Association. Feb. 10, 1948. In Press.
11. Planning for the Chronically Ill (Joint statement of recommendations by the American Hospital Association, American Public Welfare Association, American Public Health Association, American Medical Association), *J.A.M.A.*, 135:343–347, (Oct. 11), 1947. *A.J.P.H.*, 37, 10:1256–1266 (Oct.), 1947.
12. Rusk, H. A. Pediatrics Academy Survey Seeks To Expand Child Care. *New York Times*, June 13, 1948, p. 22.

Best Sellers in the Book Service for September

An Appraisal Method for Measuring the Quality of Housing:	
Part I. Nature and Uses of the Methods, 1945	$1.00
Part II. Appraisal of Dwelling Conditions. 3 Vols. 1947	5.00
Communicable Disease Control. Anderson. 2nd ed. 1948	5.00
Control of Communicable Diseases. 6th ed. 1945	.35
Diagnostic Procedures and Reagents. 2nd ed. 1945	4.00
Local Health Units for the Nation. Emerson. 1945	1.25
Planning the Neighborhood, 1948	2.50
Public Health Law. Tobey. 3rd ed.	4.50
Standard Methods for the Examination of Dairy Products. 9th ed. 1948	4.00
Standard Methods for the Examination of Water and Sewage. 9th ed. 1946	4.00
35 Year Index of the American Journal of Public Health, 1911–1945. 1948	7.00

Order from the Book Service
AMERICAN PUBLIC HEALTH ASSOCIATION
1790 Broadway New York 19, N. Y.

Physical Disability: A National Problem

HOWARD A. RUSK, M.D., AND EUGENE J. TAYLOR

Department of Rehabilitation and Physical Medicine, New York University College of Medicine, New York, N. Y.

THE lack of a systematic approach requiring the reporting of cases of physical disability to a central agency, together with varying subjective interpretations of "what constitutes a handicap," makes it difficult to stake out the boundaries of the field of rehabilitation and services to the handicapped in any quantitative fashion.

Although a census of such conditions has been proposed on several occasions (legislation calling for an exhaustive census of the physically handicapped was introduced in Congress by Senator Johnson of Colorado on March 15, 1948 [1]), there has never been a complete survey of the extent of disability in the United States. The most comprehensive source of information at present is the National Health Survey, conducted by the U. S. Public Health Service in 1935–1936.[2] In this survey, 800,000 families in 83 cities and 23 rural areas of 19 states were studied. The reliability of this study has been demonstrated in other extensive surveys on the extent of chronic disease and crippling conditions,[3-7] and although results are not strictly comparable, due to different methods of enumeration, they bear out the fact that the National Health Survey is probably the best source available for such statistics, although later studies indicate that its results are conservative.

Regardless of the inadequacies of existing yardsticks, numerous requests for statistics on the extent of disability have made a compilation of the following known existing data seem advisable.

ORTHOPEDICALLY HANDICAPPED ADULTS

In the National Health Survey, an orthopedic impairment was defined as "a permanent handicap which has been depriving the afflicted person of the natural use of some portion of his skeletal system. The term 'skeletal' has reference to the tissues of the bones, joints, and the neuromuscular mechanisms concerned with the functions of the tissues. In detail, it refers to lost, crippled, paralyzed, or deformed individual members of the body." [8]

It was reported that the estimated number of persons in the United States

TABLE 1

Estimated Orthopedic Impairments—1940

	Males		*Females*	
	Orthopedic Impairments		*Orthopedic Impairments*	
Ages	*Non-disabling*	*Incapacitating*	*Non-disabling*	*Incapacitating*
Under 15	79,700	13,200	53,500	12,500
15–24	145,600	13,300	68,700	12,300
25–44	510,100	35,600	150,700	24,100
45–64	594,100	76,500	190,300	34,100
Over 65	306,600	69,900	163,300	49,500
Total	1,636,100	208,500	626,500	132,500

with orthopedic impairments in 1940 was 2,603,000, of whom 341,000 were afflicted with incapacitating impairments, and of whom 1,844,600 were males and 759,000 were females.[9]

The distribution of these cases by sex, age, and degree of incapacity is indicated in Table 1.

The annual incidence of new cases of orthopedic impairments was estimated at 94,440 [10] distributed by sex, age, and extent of incapacity as shown in Table 2.

Kessler has estimated that on the basis of the 1940 census, there were approximately 2,000,000 disabled adults, exclusive of the war disabled, the chronically ill, the blind, the deaf and the hard of hearing.[11]

During the period of November, 1941, to August, 1945, 4,828,000 registrants for Selective Services between the ages of 18 and 37 years were rejected for military service. Of this group, 510,000, or 10.6 per cent, had manifestly disqualifying defects; 367,000, or 7.6 per cent, had musculoskeletal defects; and 235,400, or 4.9 per cent, neurological defects.[12]

THE AMPUTEES

The number of amputees in the United States has been variously estimated at from 500,000 to 2,000,000. The most generally accepted figure, including amputations of all types, is approximately 900,000, with an annual increment of 75,000.[13] The number of major amputations has been estimated at 400,000 with an annual increment of 40,000.[14]

According to the National Health Survey, it was estimated that in 1940, 673,200 persons had lost one or more toes, 65,700 persons had lost one hand or arm, 114,800 persons had lost one foot or leg, and 11,600 persons had lost two or more major members (both hands; both feet; or one or both hands and one or both feet).[15] It must be noted that these figures do not include estimates of limbs lost by men in military services during World War II, approximately 20,500 of whom had major amputations,[16] or of injury due to the great industrial activity associated with the war (it has been estimated that 65,000 war workers had major amputations as a result of accidents).[17]

CRIPPLED CHILDREN

Prior to the White House Conference on Child Health and Protection in 1930, the usual figure given for the ratio of crippled children was 2.5 per 1,000. Kessler, in later studies, estimated the ratio to be 3.72.[18] The Committee on the Physically and Mentally Handicapped of the White House Conference reported that there were 368,325 crippled children in the United States in 1933,[19] or 3 per 1,000. In 1944, there were 373,177 *registered* crippled children according to the Children's Bureau.[20]

CEREBRAL PALSY

Reliable statistical surveys on the in-

TABLE 2

Annual Incidence of New Orthopedic Impairments

	Males		*Females*	
	Orthopedic Impairments		*Orthopedic Impairments*	
Ages	*Non-disabling*	*Incapacitating*	*Non-disabling*	*Incapacitating*
Under 20	11,630	1,160	5,920	1,050
20–39	19,750	890	2,540	300
40–54	10,560	2,330	4,350	740
55–64	7,400	2,500	4,320	1,120
Over 65	6,190	2,850	6,020	2,820
Total	55,530	9,730	23,150	6,030

cidence of cerebral palsy have been very meager, and most references are based on the published reports of Phelps.[21]

Phelps has reported an annual birth incidence of 7 per 100,000 total population, 15 per cent of whom die in the first 5 years of life.[22] This would mean that the total number of cases in the United States based on a life-expectancy of 50 years would be approximately 336,000. At the present time, there are some 40,000 such children listed on state crippled children's registers, but the U. S. Children's Bureau estimates there are 175,000 such children in the nation.[23]

POLIOMYELITIS

As with other types of disability statistics, it is difficult to estimate the extent of disability resulting from poliomyelitis. The number of cases reported in 1945 was 13,514, as compared with 19,029 in 1944; 12,450 in 1943; 4,033 in 1942; 9,068 in 1941; 9,826 in 1940; 7,343 in 1939; and 1,705 in 1938. "Cases reported," however, means only the cases which have come to the attention of the health authorities. In some states, only paralytic cases are reported; in other states, non-paralytic cases are included.[24]

A sampling survey of approximately 1,900,000 men examined for selective service registration from April, 1942, to December, 1943, indicated that 6 out of each 1,000 showed definite signs of having had infantile paralysis sometime during their lives.

It is estimated that of infantile paralysis victims in this country, 50 per cent recover completely, 25 to 30 show light residual paralysis, 15 to 20 per cent show marked residual paralysis, and 5 to 10 per cent die.

EPILEPSY

Estimates on the number of persons in the United States subject to convulsive disorders vary from ½ million to 1½ million.[25] As there is no standard method of determining disability, there are no figures available on the number of persons disabled by epilepsy, but approximately 50,000 such persons are institutionalized.[26]

DISEASES OF THE HEART AND ARTERIES

It is estimated that, in the United States, there are between 9,000,000 and 10,000,000 persons suffering from diseases of the heart and arteries,[27] and where surveys have been conducted, from 0.3 to 6 per cent of the childhood population and 0.6 to 1 per cent of the young adult population have been found to be afflicted with rheumatic fever.[28] In a further study of 1,000 children followed for a period of 10 years after an initial diagnosis of rheumatic fever, it was found that 344 had been forced by residual heart disease to limit their activities; 135 of these were so incapacitated that they were forced to lead a sedentary existence, and 209 were restricted, in that they could not participate in competitive sports.[29]

Of the 4,828,000 men between the ages of 18 and 37 rejected by Selective Service from November, 1941, to August, 1945, 317,000, or 6.6 per cent, were disqualified because of cardiovascular difficulties.[30]

DIABETES MELLITUS

It is estimated that there are from 725,000[31] to 1,000,000 known diabetic persons in the United States, and another 1,000,000 who are unknown.[32]

TUBERCULOSIS

It has been estimated that the number of clinically significant, active cases of tuberculosis in the United States is approximately 300,000.[33] Because of varying interpretations of the need and efficacy of rehabilitation of the tuberculous, the lack of rehabilitation facilities, and the lack of any objective standards for the functional capacities of the

ex-tuberculous, there are no figures on the number of persons in the United States needing rehabilitation following tuberculosis. Siltzbach has estimated that "upward of 60,000 persons of the 'good chronic' infective group in the United States are eligible for and could derive benefit from employment under sheltered conditions," and states that the total number of patients, nationally, requiring rehabilitation services is approximately 150,000.[34] In 1944, Emerson estimated that three-fourths of all those stricken with tuberculosis would, at some time, need rehabilitation services.[35]

THE ACOUSTICALLY HANDICAPPED

In common with most types of disabilities, there are no accurate statistics on the number of acoustically handicapped persons in the United States. Estimates of the number of persons who suffer a hearing loss (ranging from a slight loss to almost total deafness) range from 7,000,000 to 14,000,000,[36] while an estimated 800,000 persons wear hearing aids[37] as compared with an estimated 1,600,000 who need them.[38]

Estimates of the number of hard-of-hearing children range from 2 to 12 per cent of the population up to a figure of 3,000,000.[39] The Office of Vocational Rehabilitation has estimated that there are at least 33,000 deaf civilians and 206,000 who are hard-of-hearing who are eligible for services from state vocational rehabilitation agencies.[40] During the 1947 fiscal year, the federal-state vocational rehabilitation agencies rehabilitated 954 deaf men and women, and 2,439 who were hard-of-hearing.

During the war years, 13,000 service men were given aural rehabilitation in Army and Navy centers.[41] On January 10, 1947, 42,191 veterans of World War II were receiving disability compensation payments for disease and disabilities of the ear, while 16,594 (as of March 4, 1947) service-connected and 1,077 (as of March 23, 1947) non-service-connected compensation claims for such disabilities were being paid World War I veterans.[42] The Veterans Administration has stated that within 20 years, the number of World War II veterans needing aural rehabilitation may be expected to increase to 200,000.[43]

THE VISUALLY HANDICAPPED

The most generally accepted figure on the number of blind in the United States is 230,000,[44] with an annual incidence of new cases of blindness at 6.6 per 10,000 population.[45]

As of January, 1948, the number of blind children enrolled in residential schools or classes for the blind was 5,876. Of these, 5,344 were in residential schools, and 532 in braille classes in public schools. There are no reliable statistics available on the number of blind children outside residential schools and classes for the blind, but the best estimate on the total number of blind school age children in the United States is about 10,000.[46]

Because of varying interpretations and legal definitions of "visually handicapped," or "partially seeing," figures vary on the number of such persons in the nation. It is estimated, however, that there are some 9,000 children at present in 620 special classes for the visually handicapped in 221 cities, and that some assistance is given to a small number of such children in rural areas. The total number of children in need of such special services has been estimated at 50,000.[47] Estimates have been made by Hathaway that one child in every 500 should be included in this group.[48]

DISORDERS OF SPEECH

There are no accurate figures on the number of adults with speech disorders, but it has been estimated that approximately 10 per cent of all school children in the United States have some form of

speech difficulty, and that in 5 per cent, the disorders are of a serious or complex nature.[49] The White House Conference of 1930 reported that 1,000,000 school children between ages 5 and 19 had speech disorders sufficiently severe as to require treatment, and noted that this did not include those who left school before the age of 18.[50] Numerous school surveys have indicated that at least 3 to 5 per cent of all school children have speech disorders serious enough to demand special assistance.

SUMMARY

Although reliable statistics and data on the numbers of disabled are incomplete, there is certainly sufficient information to conclude that (1) the totals are tremendous, (2) the rehabilitation needs of but a small percentage are being met, and, (3) in most instances those needs could be met more effectively. A scientific enumeration of the total number of disabled in the nation would be helpful for future planning, but our primary efforts could profitably be directed toward providing more and better services for the millions of cases already known.

REFERENCES

1. S. 2319. A Bill To Provide for a Survey of Physically Handicapped Citizens. Introduced by Senator Johnson of Colorado on March 15, 1948, and referred to the Committee on Post Office and Civil Service.

2. The Magnitude of Chronic Disease Problems in the United States. *The National Health Survey, 1935–1936.* Washington: U. S. Public Health Service, 1938.

3. Bigelow, G. H., and Lombard, H. L. *Cancer and Other Chronic Disease in Massachusetts.* Boston: Houghton-Mifflin, 1933.

4. Jarrett, Mary C. *Chronic Illness in New York City.* New York: Columbia University Press, 1933.

5. Downes, Jean. Findings of the Study of Chronic Disease in the Eastern Health District of Baltimore. *Milbank Mem. Fund Quart.*, Oct., 1944.

6. Munger, Claude W., and Jarrett, Mary C. *The Care of Chronic Diseaese in Pittsburgh and Allegheny County.* Pittsburgh: Federation of Social Agencies, 1947.

7. Unpublished survey of Chronic Disease in New Haven, Connecticut, by the School of Public Health, Yale University College of Medicine, 1948.

8. Karpinos, Bernard D. The Physically Handicapped. *Pub. Health Rep.* 58, 43:1573–1592, (Oct. 22), 1943.

9. Karpinos, *ibid.*, Table 2.

10. Karpinos, *ibid.*, Table 3.

11. Kessler, Henry H. *Rehabilitation of the Physically Handicapped.* New York: Columbia University Press, 1947, p. 17.

12. Physical Examinations of Selective Service Registrants in the Final Months of the War. *Med. Stat. Bull. No. 4,* Washington: National Headquarters, Selective Service System, June 1, 1946, p. 36.

13. Testimony of Mrs. Agnes Schnaus, American Federation of the Physically Handicapped. Report of the Subcommittee to Investigate Aid to the Physically Handicapped, House of Representatives, 78th Congress, 2nd Session, p. 1097.

14. Klopsteg, Dr. Paul W. *Terminal Reports on Artificial Limbs.* Washington: National Research Council Committee on Artificial Limbs, 1947, p. 7.

15. Schnaus, *ibid.*, p. 1099.

16. Klopsteg, *ibid.*, p. 7.

17. Schnaus, *ibid.*, p. 1099.

18. Kessler, Henry H. *The Crippled and Disabled,* New York: Columbia University Press, 1935, p. 36.

19. White House Conference on Child Health and Protection Committee on Physically and Mentally Handicapped. *The Handicapped Child,* New York: Appleton-Century, 1933, p. 134.

20. *Facts About Crippled Children.* Washington: Government Printing Office, 1945, p. 1.

21. Perlstein, M. A. *The Problem of Cerebral Palsy Today.* New York: Association for the Aid of Crippled Children, 1947, p. 9.

22. Phelps, Winthrop. Recent Significant Trends in the Care of Cerebral Palsy. *South. M. J.*, 39:132 (Feb.), 1946.

23. U. S. Children's Bureau, Social Security Administration, Federal Security Agency, Press release of Apr. 14, 1947.

24. All figures from publications of the National Foundation for Infantile Paralysis.

25. Glaser, M. A., and Irons, M. Is the Epileptic a Safe Motor Vehicle Driver. *J. Nerv. & Ment. Dis.*, 103:21 (Jan.), 1946.

26. Sands, Harry. Epileptic Child Can Lead a Normal Life. *The Child,* 10:189 (June), 1946.

27. Statement of Dr. Rolla E. Dyer, Assistant Surgeon General, U. S. Public Health Service in memorandum of May 28, 1947.

28. Paul, J. R. *Epidemiology of Rheumatic Fever and Some of Its Public Health Aspects.* New York: Metropolitan Life Insurance Co., 1943.

29. Jones, T. D., and Bland, E. F. Rheumatic Fever and Heart Disease; Completed 10 Year Observations on 1,000 Patients. *Tr. A. Am. Physicians,* 57:265, 1942.

30. *Med. Stat. Bull. No. 4, op. cit.*, p. 36.

31. Spiegelman, M., and Marks, H. Age and Sex Variations in the Prevalence and Onset of Diabetes Mellitus. *A.J.P.H.*, 36:26 (Jan.), 1946.

32. Joslin, Elliott P. Diabetes in 1948. *Am. Diabetes Forecast* 1:16 (Jan.), 1948.

33. Statement of Holland Hudson, National Tuberculosis Association before the Subcommittee to Investigate Aid to the Physically Handicapped, House of Representatives, 1st sess. July 10, 1945, p. 1521.

34. Siltzbach, Louis E. *Clinical Evaluation of the Rehabilitation of the Tuberculous.* New York: National Tuberculosis Association, 1944, p. 57.

35. Testimony of Dr. Haven Emerson before the Subcommittee to Investigate Aid to the Physically Handicapped, House of Representatives, 78th Congress, 2nd sess. October 3, 1944.

36. Statement of Dr. C. Stewart Nash, President of the American Hearing Society in press release of September 1, 1946.

37. Silverman, S. R., and Taylor, S. G. The Choice and Use of Hearing Aids in *Hearing and Deafness: A Guide for the Layman,* edited by Hallowell Davis, M.D., New York: Murray Hill Press, 1947, p. 211.

38. Statement of Estelle Samuelson, Executive Secretary, New York League for the Hard of Hearing, by telephone, February 14, 1946.

39. Silverman, S. R. Hard of Hearing Children, in *Hearing and Deafness, ibid.*, p. 354.

40. Press release, Office of Voational Rehabilitation, Federal Security Agency, Washington, D. C., November 10, 1947.

41. Canfield, Norton. Rehabilitation of the Deafened. An address before the Colorado State Medical Society on September 13, 1946.

42. Compilation of the Claims Statistics Service, Office of the Assistant Administrator for Claims, Veterans Administration, Washington, D. C., October 1, 1947.

43. Statement of Dr. C. Stewart Nash, *ibid.*

44. Yahres, Herbert. *What Do You Know about Blindness.* New York: Public Affairs Committee, 1947, p. 4.

45. *Pub. Health Rep.*, 56:46 (Nov.), 1941.

46. Berthold, Lowenfeld, Director of Educational Research, American Foundation for the Blind, Letter of March 15, 1948.

47. Hathaway, Winifred. *Education and Health of the Partially Seeing Child.* New York: Columbia University Press, 1947, p. 3.

48. Hathaway, Winifred. *Education and Health of the Partially Seeing Child.* New York: Columbia University Press, 1943, p. 26.

49. Johnson, Wendell. Some Children You Should Know, in *Children Who Are Exceptional.* Chicago: National Congress of Parents and Teachers, 1945. p. 24.

50. White House Conference on Child Health and Protection, *ibid.*

The Participation of Puerto Rico in the Federal Health and Hospital Program*

E. GARRIDO MORALES, M.D., DR.P.H., F.A.P.H.A.
Hospital Administration Consultant, U. S. Public Health Service, San Juan, Puerto Rico

THERE is perhaps no other community under the American flag where there is greater need for health and hospital facilities than the Island of Puerto Rico. An extremely high population density, together with a peculiar socio-economic structure and a tropical environment results in widespread unemployment, comparatively low wages, low standards of living, and a high incidence of disease, notably diarrhea and enteritis, tuberculosis, hookworm, and malaria.

The seriousness of these health problems is evident if we realize that during the past several years diarrhea and enteritis and tuberculosis, 2 preventable diseases susceptible to control measures, have been responsible for approximately one-third of the total number of deaths registered on the Island. Out of a total of 27,570 deaths from all causes recorded on the Island during the year 1946, 4,697 were certified as diarrhea and enteritis and 4,317 were reported as caused by tuberculosis. Maternal and infant mortality is higher in Puerto Rico than in comparable communities in continental United States. Only 20 per cent of the total births recorded on the Island during the fiscal year 1947 occurred in hospitals and 71 per cent of the total deaths registered during the year 1946 were certified by physicians without attendance for the last illness.

Intestinal parasite infestations are extremely common, especially in mountainous districts of the Island, and although it is generally accepted that the severity of infections has decreased as a result of sanitation and treatment programs sponsored by the Insular Health Department during the last 25 years, the proportion of infected persons remains extremely high. Malaria is endemic and, although there has been a considerable reduction in the mortality rate as well as the parasite index during the last 15 years, the disease still remains as a major public health problem since there are numerous anopheline breeding areas which are potential foci of infection.

Although there are few reports on the incidence of syphilis in Puerto Rico, it has been estimated that approximately 10 per cent of the urban and 5 per cent of the rural population have a positive serology, presumably of syphilitic origin. Out of 32,000 blood specimens examined from selectees on the Island during World War II, 12.8 per cent showed a positive serology.

According to the Organic Act of Puerto Rico approved by the United States Congress during the year 1917, the Commissioner of Health is in charge of all matters pertaining to health and charities on the Island. In harmony

* Presented before the Seventh Annual Meeting of the Puerto Rico Public Health Association held in San Juan, Puerto Rico. February 11, 1948.

with the provisions of the Organic Act, the Insular Department of Health has 3 divisions, namely: Public Health, Hospitals, and Public Welfare.

It is an accepted fact that provision of health services under full-time medical officers is a fundamental need of every community. During the year 1926, the first full-time health unit was organized in the municipality of Rio Piedras. By 1938 the entire population of the Island covering 76 municipalities was served by health units under full-time medical officers. A program of rural medical dispensaries, which was being operated by the Puerto Rico Reconstruction Administration, was transferred to the Insular Department of Health during the year 1938 and a total of 33 dispensaries were operated during the fiscal year 1941, and 55 during the fiscal year 1942. At the present time the Insular Health Department operates 76 health units out of which 51 are in rented buildings; 10 sub-units in urban communities, out of which 7 are in rented buildings; and 83 rural medical dispensaries, out of which 5 are in rented buildings. A total of 22 tuberculosis clinics for diagnosis and ambulatory pneumothorax treatment are operated as a part of the health unit program.

During the past 10 years the U. S. Public Health Service has been carrying out coöperative programs through grants-in-aid to the Insular Health Department for the solution of many health problems, particularly venereal diseases, tuberculosis, and general health. Programs related to maternal and child health, child welfare, and aid to crippled children are being carried out in coöperation with the U. S. Children's Bureau, which functions under the Federal Security Agency.

Funds made available to the Insular Health Department during a period of 10 years, totalled $84,752,776 out of which $4,588,675 were allotted by the U. S. Public Health Service for General Health, Venereal Diseases, and Tuberculosis Control. Beginning with the fiscal year 1944, approximately one-third of these funds are expended for public health, one-third for hospital care of the indigent, and one-third for public welfare.

The employment of trained personnel is essential to the success of any public health or medical care program. Unfortunately there are not enough physicians, registered nurses, laboratory technicians, sanitarians, health educators, and other technical personnel to carry out the medical and public health work that is needed on the Island but this is also true to some extent on the Continent. Progress, however, has been made and the provision of fellowships by the University and the Insular Department of Health, together with the establishment of a department of public health for graduate training at the School of Tropical Medicine, are steps forward in the right direction.

The per capita income in Puerto Rico is extremely low as compared with similar communities in the Continental United States. According to a survey carried out by Mountin, Pennel, and Flock[1] during the year 1935, 90 per cent of a representative group, including 6,000 families in Puerto Rico, had an income of less than $500 per year while only 4 per cent earned $1,000 per year or more. The average annual income per family was estimated to be approximately $230. Another survey conducted during the year 1941 among 2,000 rural and urban wage earners' families scattered throughout the Island revealed that the average annual income per family was $341. The 1941 study was sponsored by the Insular Department of Labor and the Works Progress Administration. Although it is believed that these incomes are higher at the present time, the fact still remains that the great majority of the people on the

Island cannot afford to pay for medical services, including hospitalization.

With the exception of mental, tuberculous, and contagious patients, which are cared for in Insular institutions operated by the Department of Health, the care of the indigent sick has been a responsibility of the different municipalities. During the year 1935, a survey carried out by the U. S. Public Health Service revealed that the Insular Health Department operated a psychopathic hospital for 1,000 patients, 4 tuberculosis hospitals with a capacity for 1,400 beds, a contagious hospital for 50 beds, and a leper colony for 90 patients.

The survey revealed that the type of medical services rendered by the great majority of the 76 municipalities of the Island was not in accordance with modern medical practice. Data collected showed that during the year 1935 there were 97 general hospitals with a capacity of 3,588 beds on the Island. Out of this number, 61 with 2,017 beds were owned by municipal governments, 2 with a capacity of 130 beds were owned by the Insular Government, and 34 with a total of 1,441 beds were private. Out of a total of 76 municipalities on the Island, with a population of approximately 2 million people, 61 owned municipal hospitals, 7 of which were not used for the care of patients and 15 did not have a hospital building. First-class municipalities operated 5 hospitals with a capacity for 757 beds, 22 second-class municipalities operated hospitals with a capacity for 718 beds, and 34 third-class municipalities operated hospitals with a capacity for 542 patients.

Expenditures for all purposes in the 76 municipalities during the year 1935 totalled $5,594,545, out of which $2,705,320 was expended by five first-class municipalities, $1,760,316 by 22 second-class municipalities, and $1,128,907 by 34 third-class municipalities. First-class municipalities used 18.1 per cent of their total expenditures for medical care as compared with 19.8 per cent and 16.5 per cent of total expenditures, respectively, used by second- and third-class municipalities for the same purpose.

There was no x-ray or clinical laboratory in any of the hospitals located in third-class municipalities. Out of 22 hospitals located in second-class municipalities, 4 had some laboratory facilities and only 1 had x-ray equipment. Three out of 5 hospitals located in first-class municipalities had laboratory equipment and 4 had x-ray machines. Kitchen and laundry equipment were inadequate for the demands in municipal hospitals of all categories.

During the year 1935 there were 131 physicians employed by municipalities for the care of the indigent sick out of a total of 436 registered on the Island. Only 87 graduate nurses were employed in the medical care program of these municipalities.

According to a survey conducted by the Insular Health Department during the latter part of the year 1947, there were 1,298 beds for the care of mental patients, 2,254 beds for the care of tuberculosis patients, and 6,753 beds in general hospitals on the Island. Out of the total mental beds, 1,000 are government owned and 298 are private. Out of the total beds reported for tuberculosis patients, 1,892 are owned by the Insular Government and 362 are in private hospitals. There have been no additional beds provided for the care and treatment of mental patients since the year 1929, and only 400 additional beds at the Cayey Hospital, which has not begun to operate, have been provided for tuberculosis patients since the year 1935. A preventorium for approximately 100 beds was converted into a sanatorium for children of school age during the year 1942.

General hospital beds operated by the Insular Government increased from

130 in 1935 to 1,287 in 1947 through the construction of 4 district hospitals during the year 1938. Three out of these 4 district hospitals are on the approved list of the American Medical Association and the American College of Surgeons.

The number of beds in municipal hospitals increased from a total of 2,017 reported during the year 1935 to 2,145 recorded during the 1947 survey, or 128 beds in a period of 12 years. The expenditures reported for medical care in all municipalities increased from $1,023,564 during the year 1935 to $2,780,643 during the year 1947, or an increase of 171.6 per cent. First-class municipalities expended $488,335 during the year 1935 as compared with $1,179,468 during the year 1947; second-class municipalities increased their expenditures from $349,371 to $932,676 during the same period, and third-class municipalities from $185,858 to $668,499. Data collected by the Insular Health Department during the 1947 survey of hospital facilities, as well as a personal inspection of a large number of municipal hospitals visited during the years 1935 and 1947, seem to warrant the statement that with the exception of the municipal hospital in the city of San Juan, and perhaps 1 or 2 other municipalities, there has been no improvement in the quality of medical services provided by municipal hospitals at present as compared with conditions revealed by the 1935 survey. Only 6 municipal hospitals had x-ray equipment in 1947 as compared with 5 during the year 1935, and 5 had laboratory facilities during 1947 as compared with 7 which reported such facilities during the 1935 survey. Twenty-nine out of 55 municipal hospitals registered during the year 1947 had no graduate nurse. One first-class municipality which operated a hospital for 175 beds reported no graduate nurse working on the staff although this hospital employed 10 physicians and 56 nurses aides.

Professional and other civic groups on the Island agree that medical care furnished by the municipalities is far below the standards of modern medical practice. Since the Insular Government, through its Department of Health, already operates a medical care program, including the maintenance of institutions for the care of mental and tuberculous patients, as well as 4 general hospitals, it is highly desirable that the Insular Health Department be made responsible for the operation of the medical care program for the entire Island. In the event this could not be worked out, then the Department of Health should participate financially in the support of such medical care programs in all municipalities willing to adopt standards of care promulgated by the Commissioner of Health with the advice of the Insular Hospital Council.

Public Law 725 of the 79th Congress provides federal assistance to states and territories for the construction of health centers, mental, tuberculosis, general, and chronic hospitals, after a survey of needs has been carried out and a statewide plan formulated, to serve the entire population.

The law authorizes the Surgeon General of the U. S. Public Health Service to promulgate regulations, with the advice of the Federal Hospital Council.

The Hospital Survey and Construction Act authorizes the expenditure of $3,000,000 to assist states and territories in the survey and planning phase of the program, and $75,000,000 annually for a period of 5 years to assist states in the provision of physical facilities. No funds are authorized in the law for the maintenance of hospitals. The appropriation Act as passed by Congress this year provides that states' applications for construction funds and approval of their application by the Surgeon General would constitute contractual obligations on the part of the

federal government. Up to $75,000,000 can be obligated during the fiscal year 1947–1948. Puerto Rico has been allotted $2,461,875 for the construction of hospitals during the fiscal year ending June 30, 1948. If Congress appropriates every year the sum authorized by Public Law 725, during a period of 5 years Puerto Rico will have available $12,309,375 of federal funds for the construction of health centers, hospitals, and related facilities. Non-federal funds are to be available for two-thirds of every project that is constructed. There must be reasonable assurance that funds will be available for maintenance after completion of the facility.

In accordance with the provisions of Public Law 725, 79th Congress, and the regulations promulgated by the Surgeon General of the U. S. Public Health Service, the Island of Puerto Rico needs 10,190 beds for mental patients; 11,593 beds for tuberculous patients; 9,174 general hospital beds, and 4,018 beds for chronic illnesses. The survey carried out by the Insular Health Department during the latter part of the year 1947, revealed that there was a total of 1,298 acceptable beds for mental patients on the Island out of which 1,000 were owned by the Insular Government and 298 were private. This leaves a total of 8,892 beds required to supply the need for this type of patients. The survey further showed that there were 2,254 beds for the isolation of tuberculosis patients out of which 1,892 were owned by the Insular Government and 362 were in private hospitals leaving a total of 9,339 to be constructed in order to supply the needs of 2½ beds per annual death taking the average for the 5 year period 1940–1945.

Beds in general hospitals totalled 6,753 out of which 1,287 were operated by the Insular Government, 2,145 by the municipalities, and 3,321 were maintained by private institutions. Of the private hospital beds 2,241 were in proprietary hospitals and 1,080 in nonprofit institutions. A total of 908 beds (364 municipal and 544 private) in general hospitals were considered not acceptable for obvious reasons, leaving a total of 5,845 acceptable general hospital beds for the entire Island and a total of 3,329 general hospital beds required for the needs of the Island.

Only 60 beds for chronic illnesses were revealed by the survey with 3,958 required to meet the needs of the Island.

It is very difficult to estimate the approximate cost of a construction program of health centers and hospital facilities such as that needed for Puerto Rico, not only because of the unsettled condition in the construction industry which is unquestionably subject to changes in a long-range program such as that contemplated, but also because construction estimates for the continental United States are not applicable to Puerto Rico for obvious reasons. However, after careful consideration of available data it has been estimated that a total of $101,443,000 is required for the construction of the overall program in Puerto Rico which includes 25,518 hospital beds. This estimate includes 8,892 beds for mental patients at $4,000 per bed, 9,339 beds for tuberculous patients at $4,000 per bed, 3,329 general hospital beds at $5,000 per bed, and 3,958 beds for chronic patients at $3,000 per bed. Construction of health centers is not included in this estimate because there are no final figures available as to the number of these centers needed for the Island in accordance with federal standards. However, since the entire population covering 76 municipalities is now served by health services and 58 health units or sub-units in urban communities, and 5 rural medical dispensaries are located in rented buildings, we believe that $3,000,000 will be required to provide physical facilities for health services which are now located in rented buildings.

Estimated funds required for the maintenance of additional hospital facilities needed in Puerto Rico, based on present expenditure by the Insular Department of Health for the maintenance and operation of similar institutions totalled $21,508,500 per annum.

This estimate is based on an annual expenditure of $1,500 per bed for general hospitals, $800 for tuberculosis hospitals, $750 for mental institutions, and $600 for chronic hospitals.

High government officials are of the opinion that Insular funds required for construction, maintenance and operation of such a comprehensive hospital program, would not be available in the future. It is believed, however, that funds will be available to construct and operate a substantial part of the program. Upon recommendation of the Hon. Jesus T. Piñero, Governor of Puerto Rico, the Insular Legislature on May 7, 1947, approved Act No. 50 (House Bill No. 1374). This law designates the Commissioner of Health, with the advice of an Insular Hospital Board, to carry out an inventory of existing hospital facilities, formulate an Island-wide plan of needs, and supervise the construction program. Act No. 50 appropriates the sum of $92,000 for survey and planning and $5,225,000 for the construction of needed hospitals and health centers. Since non-federal funds are to be available for two-thirds of the construction cost of projects, funds already appropriated by the Insular Legislature are slightly over what is needed to match the federal allotment for the fiscal year ending June 30, 1948. It is expected that funds will be appropriated during the present session of the Insular Legislature to match the federal allotment for the fiscal year 1949.

The Federal Hospital Survey and Construction Act requires that each hospital constructed with federal participation must provide a reasonable volume of hospital services to persons unable to pay, except in cases when such a requirement is not feasible from a financial standpoint. Since it has been estimated that approximately 80 per cent of the Island's population is unable to pay for medical services, presumably the great majority of hospitals to be constructed under the provisions of Public Law 725, 79th Congress, will be sponsored by Insular or municipal governments.

In accordance with the provisions of the Federal Hospital Law, however, private non-profit institutions are eligible for federal participation. Project applications must be submitted through the Commissioner of Health and should be in accordance with the Insular hospital plan. In all cases the facilities to be built must meet minimum federal standards, there must be reasonable assurance that funds will be available for the operation of the facility after the project has been completed and licensure legislation providing minimum standards for the maintenance and operation of hospitals receiving federal aid must be enacted by the Insular Legislature by July, 1948.

Before closing I should like to state that the formulation of a sound Island-wide health and hospital plan is the responsibility of the Commissioner of Health of Puerto Rico with the advice of the Insular Hospital Council. Before the plan is submitted for the approval of the Surgeon General of the U. S. Public Health Service it is required that a public hearing be held. Representatives of the medical and allied professions, as well as members of different professional and civic organizations, will have the opportunity to make suggestions. The Surgeon General will approve the Insular plan if it conforms to the federal act and regulations.

REFERENCE

1. Mountin, Pennel, and Flock. Illness and Medical Care in Puerto Rico. *Pub. Health Bull.*, No. 237, June, 1947.

Coördination of Preventive and Curative Services in Maryland

WILLIAM H. F. WARTHEN, M.D., M.P.H., F.A.P.H.A.
Health Officer of Baltimore County, Towson, Md.

THE origins and purposes of the program for supplying medical care to those in the counties of Maryland who would not otherwise receive it have been reviewed and the techniques of administering the fee-for-service plan described.[1] It has been pointed out that the delegation of administrative responsibility for the program was made possible by the pattern of organization of full-time county health departments which have been developed during the last two decades in all of the 23 counties of Maryland.[2] Some concern, however, has been expressed by those who have recently studied the Maryland plan about the justification of health department administration of medical care unless the official health agency can make all the proved preventive services available to clients of the medical care program.[3] In May of 1947, a little more than two years after the law was passed creating a Bureau of Medical Services, Dr. Robert H. Riley, Director of the Maryland State Department of Health, appointed a committee of staff members * to study, discuss, and make recommendations concerning the ways and means for establishing policies to promote closer coördination between the preventive and the curative services of the department. The committee has found that medical care in Maryland is logically a function of the State Department of Health. It has been determined as well that much has already been accomplished in integrating the preventive and curative services of local health departments, but much more can and should be done in this highly important endeavor.

THE COUNTY ADVISORY COMMITTEE ON MEDICAL CARE

One of the first decisions reached by the Maryland state-wide Council on Medical Care whose establishment was provided for in one of the sections of the Medical Care Law, was the creation in each county of a County Advisory Committee on Medical Care.

The membership of this Advisory Committee as originally suggested was to include 3 physicians nominated by the county medical society; 1 representative of the county or district dental society, and 1 pharmacist chosen by the Maryland Pharmaceutical Association. The Executive Secretary of the County Welfare Board, the Chairman of the Board of County Commissioners or his delegate, and the county health officer were to serve *ex officio*. The health officer was to serve as Chairman. The Council further recommended that additional members named by the health officer should be chosen from minority racial groups, from the Department of

* Committee on the Coördination of Preventive and Curative Services: P. F. Prather, M.D., Deputy State Health Officer of Washington County, W. B. Johnson, M.D., Deputy State Health Officer of Dorchester County, William A. Harris, M.D., Deputy State Health Officer of Charles County, Dean Roberts, M.D., Chief, Bureau of Medical Services, Maryland State Department of Health, W. Ross Cameron, M.D., Chief, Division of Cancer Control, Maryland State Department of Health, William H. F. Warthen, M.D., Deputy State Health Officer of Baltimore County, Chairman.

Education, the local hospitals, and existing special lay health organizations.

The health officers of the several counties at once organized committees on medical care in accordance with recommendations of the Council. It was soon evident from the experience of many counties that the health officer could develop a close working relationship between the practitioners of medicine and the health department by the active operation of such a committee on medical care. The most valuable function of such a committee is to advise the health officer in regard to local situations in the county so that he may plan and carry out more intelligently and effectively a program adjusted to the needs of his particular area.

The effective functioning of an advisory committee on medical care or other similar counseling group depends largely upon the success of the individual health officer in bringing together the key people in the official agencies and in the important professional and lay groups. A well organized advisory committee is important evidence of successful leadership on the part of a health officer.

The frequency of meetings of a committee may vary with the needs and conditions in individual counties, but there never should be less than 4 meetings each year. A regular monthly meeting is often desirable, but where the committee is large, subcommittee meetings may be held at shorter intervals and the meetings of the whole committee less frequently. Some health officers may wish to enlarge the membership of the committees, as was recently recommended by the State Council, and to expand the advisory function of the committee to cover all functions of the health department, preventive or curative.

THE COUNTY HEALTH DEPARTMENT AND THE PRIVATE PHYSICIAN

At the beginning of the medical care program each health officer presented the proposed plan to his county medical society for its endorsement. It is both wise and proper for the health officer to make periodic reports to the society on the progress of the various phases of the program. The frequency of these reports must, of course, depend upon the judgment of the health officer.

A personal interview between the health officer and every new physician who establishes a practice in the county is a valuable means of promoting a close working relationship between these practitioners and the health department. In this interview, the medical care and preventive program can be fully explained. In some counties the health officer may be able to visit periodically all the private physicians practising in his county. Where this is possible, the health officer is able to keep the practitioner fully informed regarding his working connection with the services of the health department.

Another valuable aid in securing the fullest coöperation between the health department and the private practitioners of medicine is a regular visit by the public health nurse to the private physicians in her district. The purpose of the visit should be to explain to the physician the ways in which she may be helpful in his work with his own patients. Such visits by the public health nurse are, however, of value only when the health officer has already established a friendly coöperative relationship with the particular physician to be visited.

The Committee on Coördination recognizes the need for a more effective program of public health education and of better public relations, particularly with the professional groups primarily concerned. A striking example of poor practice in such matters is the large number of mimeographed sheets now sent in unsealed envelopes to physicians. This practice should be changed at once

if public health information is to be gotten to the private physician in such a way as to produce effective action.

PATIENT MASTER INDEX FILE OF PREVENTIVE AND CURATIVE SERVICES

At the present time each county health department maintains a separate file of records for each specialized program. A single patient or family may have records in as many as four or five of these files, but the files are seldom crossed-indexed or coördinated. For example, when a patient comes to a maternity hygiene clinic there is no simple way of determining whether or not this patient has also received service from any other department program, such as tuberculosis or medical care. In order to provide a simple means for assembling all the pertinent data concerning a particular patient, a master index file should be maintained in each health department. This file would contain a separate card for each individual served by any program, preventive or curative, of the health department.

The card should include the name, color, sex, date of birth, and, to prevent confusion of patients with the same name, the name of the head of the family. There would be entered on each card the type of any clinical record already on file in the health department and the place in which it is to be found. The type and location of records may be indicated by abbreviations or coded numbers if that seems desirable. Inactive records should be easily recognizable. It is most important that the individual cards be filed in alphabetical order by surname and be readily available, completely summarized, and easy to use.

The maintenance of a master index file in each county health department should be made the duty of one individual who is charged with the responsibility for making all entries and keeping the file current and in satisfactory order. Provision must be made for all new information regarding active or closed cases to be reported at once by field and clinic workers to the person in charge of the file.

PERIODIC REVIEW OF MEDICAL CARE CASE SUMMARY RECORDS

The Medical Care Case Summary Record used in local health departments in Maryland contains information which, if carefully reviewed by the health officer, gives valuable aid in determining the amount, kind, and quality of care that is being given. A periodic review of these records is perhaps the best means of becoming familiar with the overall operation of the program in a county and with the individuals receiving care as well. These summary sheets are made up from the *Medical Reports of Services Rendered* and *Dental Reports of Services Rendered,* which are the monthly statements of the services rendered by individual physicians or dentists. These service records have been designed to give the maximum possible amount of useful information without being unduly burdensome to physicians and dentists rendering care under the program.

The medical care clerk should in the course of her daily work, set aside for review by the health officer or his representative, groups of summary records on the basis of the following criteria: (1) cases costing more than $50 in a period of 6 months, excepting obstetrics and surgery, or cases costing more than $25 in a period of one month, with the same exceptions; (2) all cases showing use by a client of two or more physicians in any one month, unless one of the two is a consultant; (3) all cases having multiple diagnoses; (4) all cases needing special attention such as reportable diseases, cancer, heart disease, or diabetes.

The health officer may set aside a regular time for reviewing the informa-

tion on the summary records which have been chosen by the medical care clerk on the basis of the criteria cited above. In this review, evidence of inadequacy of medical care or of abuse of the program by vendees or vendors may be noted, any apparent discrepancy between the diagnosis as recorded by the physician and the amount and character of service reported as given may be recognized, and the health officer may be able to judge if the preventive measures offered by the health department have been fully utilized, or if the case is in need of hospitalization.

The county advisory committee on medical care can and should play an active part in assisting the health officer in reviewing any of the summary records that present special difficulties or that cannot be handled in a routine manner. The committee can be of invaluable assistance to the health officer in difficult and puzzling cases, particularly when the health officer feels need of the advice of medical men better acquainted than himself with current clinical procedures.

When found necessary, or advisable, the health officer should confer personally with the physician treating a patient whose records present any unusual features and should discuss with him the findings about which question has arisen. Any action of a health officer in disposing of difficult or controversial cases should take into account the available diagnostic, clinical, and rehabilitation services available in the community. Each health officer should work out a method of his own for the disposition of especially difficult cases. He may, for example, after consultation with his county advisory committee, decide to form a subcommittee consisting of physician members who would sit with him individually or collectively when he confers in his own office with a particular physician who appears, from the data on the case summary record of cases treated by him, to be incompletely informed or to have misinterpreted the provisions of the program or who seems to be abusing the service.

The health officer should always keep in mind that these situations are the most liable of all his relations with physicians to give rise to misunderstanding and resentment. Each case should be handled with extreme care and with the utmost tact and consideration. To suggest even indirectly that the physician is neglecting the patient on the one hand, or making unnecessary visits on the other, will almost always arouse antagonism and may permanently destroy the possibility of maintaining good relations between the physician and the health department.

CONSULTATION SERVICES

The medical care program should not establish consultation services which in any way duplicate those already in operation. Every effort should be made, however, to encourage full utilization of existing clinics by patients who are eligible under the medical care program, as well as by patients who are eligible under other health programs. Physicians should be encouraged to refer such patients as are in need of consultation services to the orthopedic, cardiac, and hearing clinics sponsored by the crippled children's program. The services of the chest clinics are also fully available to clients of the medical care program. The medical care program discovers many patients with complicated gynecological problems who are greatly in need of consultation services; and consultation clinics in gynecology will soon be developed by the Bureau of Child Hygiene.

The Bureau of Medical Services should endeavor to supplement existing consultation services by the establishment, as soon as is practicable, of consultation clinics in such fields as ophthal-

mology, internal medicine, surgery, and in any other fields in which such service is needed and not now available. The medical staffs of these consultation clinics should possess the highest possible professional qualifications. They should preferably be licentiates of the appropriate specialty board or have equivalent training and experience. Wherever practicable, use should be made of members of the faculties of the medical schools of the state.

PUBLIC HEALTH NURSING VISITS TO MEDICAL CARE PATIENTS

The health department should make every effort to have a public health nurse visit each case or family as soon as possible after admission to any of its services. The visit should be designed both to determine the health needs of the patient and his family and to give any necessary nursing care. The nurse should always attempt to teach someone in the home to render as much of the necessary nursing care as possible so that too frequent nursing visits will not be required.

Before inaugurating such a nursing system, the health officer should discuss with his advisory committee the method of arranging with the attending physicians for nursing visits. In most cases it would seem advisable for the health officer to present the matter to every eligible physician at the beginning of the program, either individually or at a meeting of the county medical society. This should do much to avoid misunderstanding on the part of physicians and prevent the development of any feeling that the nurses are in any manner checking up on attending physicians.

All cases enrolled in the medical care program should, as far as practicable, be visited periodically by the public health nurse. Such visits will frequently bring to the attention of the nurse other persons in the family who need either preventive or curative service which might be provided by the health department. All cases should be visited which have not been seen by the nurse within the period specified in the nursing policy of the department. This period will vary according to the need of individual cases and will of course be dependent upon the nursing personnel available. The actual planning of the frequency of visits will, therefore, be based on the judgment of the health officer. In all visits of this nature and in all plans for the care of patients and families visited, the public health nurse should be guided by the *Nursing Manual of the Maryland State Department of Health.*

PHYSICAL EXAMINATIONS

It is evident to everyone familiar with the medical problems in the social and economic classes from which come most of the patients receiving medical care under the state program, that there exists in this group a great reservoir of unrecognized, and therefore untreated, disease and defect. Ideally, it would perhaps be advisable to provide a system whereby all recipients of the service would receive a complete physical examination at the time of their enrollment and at stated periods thereafter.

The economic and technical difficulties in the way of establishing such a system are at present so great, however, that it is obviously impracticable to attempt to put it into effect at this time. It is, therefore, all the more important that the facilities for diagnosis now available should be used to the fullest possible extent.

Two of the most valuable aids to diagnosis, an x-ray of the chest and a chemical and microscopic examination of the urine, can now be provided without difficulty through the existing facilities of local departments of health. It would, therefore, seem the part of wisdom to explore the possibility of furnishing these two diagnostic services to every

new case enrolled for medical care. The results of this exploratory procedure may well point the road to a practicable plan for more comprehensive examinations in the future.

CHILD HYGIENE SERVICES

Present prenatal clinics and obstetrical consultation clinics should be enlarged and expanded and new clinics organized in areas where there is need for increased service to medical care patients, and the present policy of calling the attention of private physicians to the availability of these services should be continued. Child health conferences should similarly be enlarged and new services inaugurated in areas as need arises. This need can frequently be determined on the basis of the distribution within the county of medical care patients less than 6 years of age. Here again, as in maternity hygiene, it is important to interest private physicians in utilizing these child health conferences.

School health service in Maryland is rendered as a joint activity of the departments of education and health and the coördination of preventive and curative medical services for this age group is an extremely complicated matter. It is to be hoped that the joint State School Health Council will be of assistance in this matter, and it is recommended that in each county there be formed a county school health council with the health officer and the superintendent of schools serving as co-chairmen. In this local group the Parent-Teacher Association, the medical society, and the dental society should also be represented. These councils should have regular monthly meetings if they are to succeed in securing the necessary improvement in the coördination of school health with other health department services.

DENTAL SERVICES

The complexities involved in rendering either preventive or curative dental services by public agencies make it a major problem in public health. Among the difficulties are: (1) the almost universal prevalence of dental caries, the results of previous failure to treat dental caries and the recurrent character of dental diseases; (2) the inadequacies of present facilities for dental services; and (3) the great lack of appreciation on the part of the public of the importance of oral health, of the value of preventive dental practices, and of "preventive-curative" care for the young age group.

Preventive-curative services include those operative procedures carried out, usually in younger children, as a means of preventing incipient and small defects from becoming gross. This activity is the one that promises the best results so far as future dental health is concerned. It is essential to the success of such a service that it be concentrated on the full meeting of all the dental needs of as many individuals as possible rather than the partial meeting of the needs of larger groups. The eventual evaluation of a dental health program may well be based on a high ratio of the number of teeth conserved by filling as against the number extracted.

Restorative dental service includes those procedures necessitated by previous failure to employ the foregoing "preventive" practices, and in older age groups is based principally on the necessity for: (a) masticatory functions; (b) appearance, as influencing employability; and (c) health as it is influenced by lack of functions and by appearance.

There is obvious need for a closer correlation between health departments and the dental profession if we are to make full use of the profession as part of our general public health activity. A clearer understanding of health department activities by members of the dental profession would well serve both groups, and in the hands of the general

practitioner of dentistry lies the ultimate solution to the problem of dental health.

LABORATORY SERVICES

It is recognized that any program which seeks to correlate preventive and curative services in county health departments will of necessity require an increasingly large volume of service by the public health laboratory for patients of the medical care program. The need for laboratory service is obvious if patients enrolled under the medical care program are to receive adequate service.

Current information concerning laboratory services should be available to all participating in the program. Physicians and department staff members should be advised at once as to extensions or other changes in the service, and efforts should be made to induce them to make full and discriminative use of it.

REHABILITATION SERVICES

The curative services provided by the health department can be substantially strengthened by coördination with the vocational rehabilitation program of the State Department of Education. This rehabilitation program offers a very complete range of services to persons who have a physical disability which constitutes a vocational handicap. For such persons the rehabilitation program provides the following services:

1. General medical examination by the family physician
2. Consultation and diagnostic services when necessary
3. Physical restoration which may include surgery
4. Certain types of medical, dental, and psychiatric treatment
5. Prosthetic appliances including artificial limbs
6. Hearing aids
7. Vocational training, counseling, guidance, and job placement

The services indicated above are available only to persons who offer a reasonable prospect of placement in remunerative employment. In the review of its cases the health department should keep constantly in mind the possibility of referral of suitable cases to the rehabilitation program.

In order to make full use of the service, the county health departments should receive current literature regarding the rehabilitation services available. It may invite representatives of the rehabilitation service to discuss their program with the staff of the county health department, and may also request the local representative of the vocational program to review periodically with the health officer the records of those cases suitable for rehabilitation.

CONCLUSIONS

Three years after its inauguration in Maryland the medical care program shows satisfactory progress toward absorption into the regular routine of the county health departments. Much still needs to be done to bring the existing preventive services into more perfect alignment with curative services as exemplified by the medical care program. The committee has carefully explored all the factors which in its judgment may so far have had a bearing upon the success of this absorption. It has considered as well those factors which may in the future influence the smooth and speedy establishment of a closer working relationship between the preventive and curative services in the interests of a broadened and more efficient public health service to the people of the state by the several county health departments. The general conclusion has been reached that medical care, as it has been established and applied in Maryland, is properly a function of the state health department and its component local health units. This opinion is concurred in by the deputy health officers who have participated in the discussions of the committee and by those vitally

and immediately concerned in the central office who have been consulted or have supplied material to the committee.

The major assignment of the committee has been the task of bringing into existence a list of ways and means for improving immediately and at long range, whenever possible, the preventive and curative services of the county health departments and for effecting as rapidly as is reasonable a complete integration of these two services. The assignment has been accepted and the task assumed by the committee, and the results of its work are shown in summary form in a series of recommendations. It is with guarded hope for the soundness and lasting practicability of these recommendations that the committee submits them.

RECOMMENDATIONS

1. The county advisory committee on medical care is, when wisely directed by the health officer, a useful instrument in enhancing close working relationships between the health department, the private physician, and other key individuals in official and nonofficial agencies. Such a committee should meet regularly. Serious and immediate consideration should be given to enlarging the membership to include those individuals familiar with school health and general community activities.

2. Periodic reports of the progress of various phases of the complete health department program should be made by the health officer to the county medical society. The frequency and character of these reports must rest entirely with the judgment of the health officer.

3. The health officer should include in his duties a personal interview and conference with each new physician who establishes a practice in the county. This conference should include a thorough review of all health department activities.

4. An effort should be made by the health officer to establish a regular procedure for visits by the public health nurse to the private physicians in her district. This is possible only when the health officer has been able to achieve a friendly, coöperative relationship with the physicians to be visited.

5. There is evident need in the county health departments for a more effective program of public health education and of public relations, particularly those directed toward professional groups. The committee recommends that a special committee be appointed to study this problem.

6. Each county health department should establish as soon as practicable a master index file, alphabetically arranged, of individuals receiving services, both preventive and curative, from the health department. This file should be maintained in readily usable and current condition and should form the basis for planning for all services of the health department.

7. The Committee on Coördination of Preventive and Curative Services is strongly of the opinion that it is a highly important and almost necessary procedure in each health department to institute and systematize a review of the data currently entered on the case summary records in order to maintain a satisfactory current knowledge of the way in which the medical care program is being carried out in the county. Review of the information on these records should be a critical one carried out routinely by the health officer or his representative.

The county advisory committee on medical care should play an active part in assisting the health officer in reviewing those records which present special difficulties and cannot be handled in a routine manner.

The attending physician should be asked to make a special review and report on cases which the health officer has found to be receiving continuous care over an unusually long period. The special precautions necessary in this procedure are suggested.

8. Effort should be made to supplement existing consultation services by the establishment of new consultation clinics in such fields as ophthalmology, internal medicine, and surgery, and in any other field in which such services are needed and cannot be made available through existing services.

Physicians staffing consultation clinics should carry the highest possible professional qualifications and be licentiates of the appropriate specialty board or have equivalent training and experience. If possible, they should be members of the faculty of an approved medical school. These consultation services might well be developed under the guidance of a committee representing the University of Maryland School of Medicine and The Johns Hopkins School of Medicine.

9. A continuing effort should be made by county health departments to develop the ideal of having the public health nurse visit each case or family as early as possible after admission to health department services in

order to determine the health needs of the patient and family and to give the necessary nursing care. Before inaugurating this service the health officer should discuss with his advisory committee on medical care the method of clearance of such visits with the patient's physician.

The public health nurse should be guided by the *Nursing Manual of the Maryland State Department of Health* in making visits and planning the care of the patient and family.

10. Consideration should be given to the need for providing routine physical examinations for recipients of medical care, but before attempting to develop any such program, it is believed by the committee to be essential that a careful "pilot" study be conducted in a selected area.

11. Present prenatal clinics and obstetrical consultation clinics should be enlarged, expanded, and organized in new geographical areas as indicated by the demand, to furnish increased care to medical care patients and also to suitable individuals not included in the medical care program.

Wherever possible, application for maternity care in the medical care program should result in an immediate home visit by a public health nurse to determine the need of the patient for existing services and to explain to the patient the availability of these services.

Child health conferences should be enlarged and new ones inaugurated in geographical areas where the need is demonstrated. The standards of need for these conferences should be restudied in terms of distribution within the county of medical care patients less than 6 years of age.

Wherever possible, application for pediatric care should be made the occasion for an immediate visit by a public health nurse. The purpose of the visit should be to determine the need of the patient for existing health department pediatric services, to explain to the patient the availability of these services, and wherever possible to arrange for enrollment of the infant or child in a child health conference if only for immunization purposes.

Each county health department should adopt the policy of calling to the attention of private physicians and of educators and parents the availability of certain public services for school aged children.

12. Vigorous efforts should be made by the health officer to bring about as soon as possible a closer coördination of the program of the health department with the individual practitioners of dentistry. Specific recommendations as to ways of improving distribution of dental health information to private dentists may be forthcoming, when and if a committee is formed to study public health education and public relations among professional groups as suggested in Recommendation 5 above.

13. It is recommended that laboratory services be enlarged as necessary to meet the growing demands to be placed upon it by patients actually treated clinically in the medical care program.

Steps should be taken to keep the private physicians of the county currently informed concerning the exact nature of the laboratory services which are available.

14. The curative services provided by the health department can be substantially strengthened by coördination with the vocational rehabilitation program of the State Department of Education.

REFERENCES

1. Riley, Robert H. Medical Care in Maryland. *A.J.P.H.*, 36, 8:908–911, (Aug.), 1946.

2. Roberts, Dean W. The Health Department and Medical Care. *A.J.P.H.*, 37, 3:259–263, (Mar.), 1947.

3. Kline, Howard M., Terris, Milton, Hapney, Cozette, and Kramer, Nathan A. *The Maryland Medical Care Program, A Report by the Staff of the Subcommittee on Medical Care, Committee on Administrative Practice.* New York: American Public Health Association, 1948. 151 pp.

Comparison of the Immunogenic and Anaphylactogenic Properties of Rocky Mountain Spotted Fever Vaccines Prepared from Infected Yolk Sacs and from Infected Tick Tissue*

DAVID LACKMAN, PH.D., F.A.P.H.A., AND R. R. PARKER, PH.D.

Senior Assistant Scientist, Rocky Mountain Laboratory; and Director, Rocky Mountain Laboratory, U. S. Public Health Service, Hamilton, Mont.

THE purpose of this study was to determine whether the protein present in the routine yolk-sac and tick-tissue (*Dermacentor andersoni*) vaccines against Rocky Mountain spotted fever as prepared for distribution by the Rocky Mountain Laboratory differed in immunizing value and in ability to produce anaphylaxis in the guinea pig.

METHODS

The lots of vaccine used were standardized by determining nitrogen content and complement-fixing activity against convalescent, Rocky Mountain spotted fever guinea pig sera. For each test both the yolk-sac vaccine and the tick-tissue vaccine were adjusted to the same nitrogen content. Dosages used were from 0.004 mg. to 0.160 mg. total nitrogen. Quantities below those giving complete immunity were purposely chosen so that any differences existing between the vaccines could be detected.

Male guinea pigs were used for the potency tests. Each was injected subcutaneously with the immunizing dose of vaccine 10 days prior to receiving, intraperitoneally, a challenge dose of blood taken from a guinea pig infected with Rocky Mountain spotted fever. Temperatures were taken daily for 12 to 16 days following challenge. The criteria for immunity were the absence of scrotal swelling and reddening and of a rise in temperature above 39.6° C. At the end of this period they were tested for sensitivity by injecting 1 ml. of the original vaccine intracardially.

TEST DATA AND DISCUSSION

Four tests were made. In each test, a lot of yolk-sac vaccine was compared with a lot of tick-tissue vaccine; equal numbers of guinea pigs receiving each vaccine. The analysis of the vaccine lots used is given in Table 1.

It will be noted that the yolk-sac vaccines contain about three to four times as much total nitrogen as the tick-tissue vaccines. Therefore, the yolk-sac vaccines were diluted three to four times more than the tick-tissue vaccines to bring both preparations to the same nitrogen content.

The results of vaccination are given in Table 2.

* Presented before the Medical Bacteriology Section of the Society of American Bacteriologists at the 48th General Meeting in Minneapolis, Minn., May 12, 1948.

TABLE 1

Data on Vaccine Lots Used

Yolk-sac vaccines				*Tick-tissue vaccines*			
Lot Number	*Total N mg./ml.*	*Complement-fixing unit*	*Complement-fixing units per mg. N*	*Lot Number*	*Total N mg./ml.*	*Complement-fixing unit*	*Complement-fixing units per mg. N*
S-102 *	0.280	1:16	285	F-6 *	0.085	1:4	293
S-114 *	0.339	1:2	29	F-13 *	0.118	1:16	674
S-104 *	0.435	undiluted	11	F-16 *	0.119	1:16	673
S-139 *	0.421	1:2	24	A-9	1.435	1:128	446

* These vaccines passed the minimum potency tests set up by the Biologics Control Division.

TABLE 2

Results of Vaccination

	Yolk-sac vaccine	*Tick-tissue vaccine*
Number vaccinated	68	68
Number developing intercurrent infection	17	12
Number developing Rocky Mountain spotted fever after challenge	31	21
Number showing immunity	20	35
Percentage showing immunity	39%	63%

In each test, 6 normal guinea pigs were injected with the challenge material; all 24 of these animals developed typical Rocky Mountain spotted fever. From the table it can be seen that, of the 51 guinea pigs injected with yolk-sac vaccine and challenged, 20, or 39 per cent, were protected; in the group of 56 vaccinated with equivalent doses of tick-tissue vaccine, 35, or 63 per cent, proved to be immune.

In interpreting these results it should be borne in mind that the yolk-sac vaccines as distributed contain three to four times more nitrogen than the tick-tissue vaccines, whereas, in our experiments, dilutions containing equal amounts of nitrogen were used. In actual practice, if the recommended dosages were used, a patient would receive three to four times the amount of nitrogen with the yolk-sac vaccine as with the tick-tissue vaccine. From the practical standpoint these results indicate that both preparations are about equally active in inducing immunity in guinea pigs to Rocky Mountain spotted fever.

The results of the tests for anaphylactic sensitization are given in Table 3.

From the table it can be observed that 58.5 per cent of the guinea pigs injected with yolk-sac vaccine showed anaphylaxis, whereas none of the guinea pigs injected with an equal amount of tick-tissue vaccine and tested with tick-tissue vaccine showed sensitivity. Guinea pigs recently recovered from spotted fever, and some normal ones, were also injected intracardially with the materials used in challenging for sensitivity as controls upon its primary toxicity; no reactions were noted. Therefore, the reactions obtained in the guinea pigs vaccinated with yolk-sac vaccine probably are due to true anaphylactic sensitization. In evaluating these results it should be pointed out that there is no well established connection between anaphylactogenic properties of an antigen in guinea pigs and the production of sudden deaths in human beings (such reactions often occur on the first injection) by the administration of a foreign protein. Thus, the safety of a product for administration to human beings would depend on

TABLE 3

Results of Tests for Anaphylactic Sensitization

	Yolk-sac vaccine	*Tick-tissue vaccine*
Number of vaccinated guinea pigs tested with homologous material	41	31
Number showing severe to fatal anaphylaxis	24 (58.5%)	0
Number vaccinated with tick-tissue vaccine and challenged with yolk-sac vaccine		18
Number of these animals showing sensitivity		0

the number of persons naturally sensitive to the protein in question rather than on its ability to produce anaphylaxis in the guinea pig.

CONCLUSIONS

Rocky Mountain spotted fever vaccines prepared from infected yolk sacs and from tick tissue were about equally active in producing immunity in guinea pigs. The protein present in the tick-tissue vaccines failed to produce anaphylaxis in guinea pigs, whereas that present in yolk-sac vaccines produced anaphylaxis in 58 per cent of the guinea pigs tested.

SUSTAINING MEMBERS OF THE AMERICAN PUBLIC HEALTH ASSOCIATION

American Bottlers of Carbonated Beverages, Washington, D. C.
Ames Company, Inc., Elkhart, Ind.
Association for the Aid of Crippled Children, New York, N. Y.
Borden Company, New York, N. Y.
Chlorine Institute, Inc., New York, N. Y.
Difco Laboratories, Inc., Detroit, Mich.
Diversey Corporation, Chicago, Ill.
Equitable Life Assurance Society of the United States, New York, N. Y.
John Hancock Mutual Life Insurance Company, Boston, Mass.
Hoffman-La Roche, Inc., Nutley, N. J.
Holland-Rantos Company, Inc., New York, N. Y.
International Association of Ice Cream Manufacturers, Washington, D. C.
International Equipment Company, Boston, Mass.
Josam Manufacturing Company, Cleveland, Ohio
Lederle Laboratories Division, American Cyanamid Co., New York, N. Y.
Liberty Mutual Insurance Company, Boston, Mass.
Life Insurance Co. of Virginia, Richmond, Va.
Macmillan Company, New York, N. Y.
George W. Merck, Rahway, N. J.
Metropolitan Life Insurance Company, New York, N. Y.
National Life Insurance Co., Montpelier, Vt.
Oval Wood Dish Corp., Tupper Lake, N. Y.
Prudential Insurance Company of America, Newark, N. J.
Sealright Company, Inc., Fulton, N. Y.
Sharp and Dohme, Inc., Glenolden, Pa.
E. R. Squibb and Sons, New York, N .Y.
Sun Life Insurance Company, Baltimore, Md.
Travelers Insurance Company, Hartford, Conn.
Union Central Life Insurance Company, Cincinnati, Ohio.
Upjohn Company, Kalamazoo, Mich.
West Disinfecting Co., Long Island City, N. Y.
Western and Southern Life Insurance Company, Cincinnati, Ohio.
Winthrop-Stearns, Inc., New York, N. Y.
Wyeth, Inc., Philadelphia, Pa.

Laboratory Procedure for Evaluating Practical Performance of Quaternary Ammonium and Other Germicides Proposed for Sanitizing Food Utensils

GEORGE R. WEBER, PH.D., AND LUTHER A. BLACK, PH.D., F.A.P.H.A.

S. A. Scientist; and Principal Bacteriologist, Milk and Food Sanitation Laboratory, Water and Sanitation Investigations, U. S. Public Health Service, Cincinnati, Ohio

THE evaluation of the germicidal efficiency of quaternary ammonium compounds has caused much controversy.[1] It has been recognized by most investigators that no single procedure for testing germicides supplies the complete information necessary for the use of any one compound under all types of applications. Furthermore, a testing procedure suitable for one type of germicide may not be applicable in all details to the testing of another germicide. DuBois[2] reported that "little effort has been made to develop a laboratory technique for the evaluation of sanitizing agents, without the need of a practical trial." It was hoped, "that such a technique can be satisfactorily evolved through a suitable combination of the methods described."

Following practical experience in the use of quaternary ammonium germicides for sanitizing food utensils, an effort was made to find a laboratory method suitable for the evaluation of such compounds. A number of proposed methods or variations of proposed methods were reviewed. Portions of techniques which appeared to be most suitable were selected from this series of procedures, and in some cases modified in order to formulate a laboratory procedure simulating actual practical performance of germicides when used for food utensil sanitizing.

REVIEW OF METHODS

The principal methods suggested for evaluating germicides[3] are generally of two types. One involves a comparison of the germicidal value of the test substance with a standard disinfectant (e.g., phenol coefficient), the other involves the actual determination of rate of death under standard conditions (e.g., survivor curve, in which times required to kill definite percentages of test organisms are compared).

Phenol-coefficient methods

The phenol-coefficient[4-6] type of procedure has been in use for many years in germicide evaluation for regulatory purposes and to prevent gross fraud. Much opposition has been expressed relative to the use of the phenol-coefficient procedure for evaluation of quaternary ammonium compounds. The reporting of "skips" and "wild pluses"[1] is quite common. Several modifications of the phenol-coefficient test have been proposed in an effort to compensate for what have been stated to be shortcomings of the procedure

when applied to quaternary ammonium compounds and other non-phenolic types of germicides.

In the phenol-coefficient method, the exposure period is longer than is recommended [7] or is practical for food utensil sanitation. The concentration of germicide employed bears no apparent relationship to that which would be required for sanitizing food utensils. The phenol coefficient is an abstract number and no means appears available for interpreting the phenol coefficient in terms of exposure times and germicide concentrations necessary for food utensil sanitation. The suggestion has been made [8] that twenty times the phenol-coefficient concentration would be satisfactory as a "use" concentration for certain types of applications.

Because of the surface activity of quaternaries, some investigators [1] indicate that the standard loop used for transfer would not carry a standard amount of testing suspension. Pipettes (Kahn) [9] have been substituted in an effort to overcome this difficulty. Since a positive transfer tube of broth may result presumably from one (or a few) living organisms, as well as from numerous surviving bacteria, quantitative estimations by plating have been proposed [10] in order to ascertain the *extent* of killing in those instances where complete killing is not obtained.

If one or a few bacteria are splashed on the walls of the medication tube and later mixed into the germicide, these organisms are not exposed to the germicide for the full period. In order to reduce the possibility of splashing, Pressman and Rhodes [11] devised a modified procedure in which the test organisms are carefully placed in the medication tube before the beginning of the test. Following this, the germicide was added without mixing. Other investigators have employed this principle in testing.[12]

Some doubt has been expressed as to whether negative transfer tubes actually represented 100 per cent kill in the medication tube. Klarmann and Wright [1] devised a "semi-micro" modification of the phenol coefficient, in which only one-tenth the usual volume of germicide-culture mixture was employed in order that the entire mixture might be cultured. Cade [13] has swabbed the inside of medication tubes and subsequently "swished" the swab in a tube of melted agar, with or without plating, to ascertain if test organisms were surviving.

In order to compensate for the fact that the concentration of germicide employed in the phenol coefficient bears no direct relationship to the concentration to be employed under practical food utensil sanitizing, Mallmann, *et al.*[14] have proposed a modification in which the actual "use dilution" of germicide is employed in the testing procedure.

Some investigators have felt that a test organism dried on a glass surface more nearly approached practical conditions than one suspended in the germicidal solution. In this connection, Johns [15] has proposed the use of glass slides, previously dipped in a culture of test organism and allowed to dry. Mallmann, *et al.*[14] have employed glass rods or rings previously "seeded" with the test organism and then dried. In a study of the efficiency of machine dishwashing, Mallmann, *et al.*[16] have included a test organism in a utensil soil. Following the dishwashing, the utensils were swabbed in order to ascertain the number of surviving bacteria on the utensil surface.

In the phenol coefficient the number of test organisms per ml. of test solution is rather well established in that a constant amount of a standard broth culture is added. However, different test organisms are employed (generally *Eberthella typhosa* or *Staphylococcus aureus*).[8]

Survivor-curve methods

While basically several types of ger-

micide testing procedures are related in some manner to the phenol coefficient, one which has been recognized for a good many years is the survivor-curve type.[17] In 1897 Ikeda[18] was able to show that when the logarithms of the numbers of surviving bacteria were plotted against the elapsed time, a straight line was obtained. The rate of disinfection was found to be logarithmic and generally in agreement with the rate calculated for a monomolecular reaction. Buchanan and Fulmer[3] (1930) reported that pseudomonomolecular reactions are of far more concern in biology than are the true monomolecular reactions. Sigmoid-type curves are frequently observed. Numerous workers have used the survivor curve for ascertaining the efficiency of germicides, and this type of procedure does simulate more nearly actual practical application of germicides, in many instances, than does the phenol coefficient. The survivor-curve procedure has been used for evaluation of such germicides as chlorine[19, 20] and chloramines. It was this type of testing procedure that made possible several fundamental studies relative to coefficients of temperature, concentration, and pH. Recently this type of procedure has been used for ascertaining germicidal efficiencies of quaternary ammonium compounds.[21-23, 12]

DuBois and Dibblee[23] observed in death rate studies on a high molecular quaternary ammonium compound, employing *Bacillus metiens* spores, that there was an almost immediate reduction in plate count of 60 to 75 per cent. However, even after 6 hours, only about 90 per cent of the spores were killed. McCulloch[24] has reported that quaternary ammonium compounds have a tendency to "agglomerate" test organisms, thus reducing the plate colony count without necessarily reducing the viable cells. From this, it is indicated that when the logarithms of the surviving bacteria are plotted against time of exposure, the slope of the resulting curve does not necessarily provide a true index to the rate of disinfection as it apparently does for some germicides, since this curve tends to become asymptotic, paralleling the exposure-time axis. Apparently for this reason some investigators[22, 24] have preferred to select exposure times required for 100 per cent kill for comparative purposes, rather than a lesser percentage such as 99, 99.9 etc.

Other details of methods reviewed

Since quaternary ammonium compounds are relatively new germicides, until recently we have not had available satisfactory inhibitors for inactivating the germicides, similar in action to that of sodium thiosulfate with chlorine. Even at the present time, there is some question as to the limiting ratio of inhibitor[32] to quaternary effective in protecting different types of test organisms from both bactericidal and bacteriostatic action. However, some of the recently proposed methods[25, 26, 6, 21, 12] for evaluating the germicidal efficiency of quaternaries include the use of inhibitors.

In reviewing procedures for testing quaternaries, it was noted that the volume of testing solution in the various tests, ranges from 0.55 ml. to 500 ml. Presumably the larger volume is employed in some instances in order to increase the ratio of volume to glass surface to reduce the possible effect of glass surface upon the cationic germicides. Other advantages of a larger volume appear to be to furnish sufficient material for side tests and to stabilize temperatures, particularly where high or low temperatures are to be maintained.

Generally, proposed procedures have employed either a standard nutrient broth or a standard agar medium for culturing, except in those instances where quaternary inhibitors were added to the medium. Cultures, when grown on an agar medium, were generally suspended

in a buffered medium or water. A variety of test bacteria, both Gram-negative and Gram-positive, spore-formers and non-spore-formers, has been employed for evaluating quaternaries. The number of test organisms per ml. of test solution employed by various investigators varied somewhat. In one procedure it was as low as about 1,000, whereas in another it was as high as 900 x 10^6.

Exposure intervals varied from 1 second[15] to 30 minutes.[14] In certain instances[12, 22] attempts have been made to have an exposure period which would normally take place in food utensil sanitizing.

Other details such as type of container, cover of container, addition or absence of organic matter, etc., varied considerably.

Preliminary Investigations

1. Selection of survivor-curve method

After reviewing the available methods for evaluating quaternary ammonium compounds (and other germicides) proposed for food utensils sanitizing, it appeared that none quite completely met all the necessary requirements. We have endeavored therefore to devise a method which is simple and which more nearly simulates practical conditions of application. An attempt was made to employ only equipment which would normally be found in any bacteriology laboratory. The survivor-curve type of procedure was selected because it more nearly represented actual practical conditions of food utensil sanitizing than did the phenol-coefficient type.

2. Number of test organisms

One problem considered was that of the number of test organisms per ml. of germicide solution. To determine this, plate counts were made of artificially contaminated dish water and compared with standard swab-rinse plate counts from food utensils (glasses) dipped in the dish water and allowed to drain for 15 minutes (rims up). For these studies a pure culture of *Escherichia coli* was employed. It was observed that an average ratio of bacteria per ml. of dish water, to bacteria per utensil (glass) submerged, drained and swabbed, was about 100/1 for both heavily and lightly contaminated dish waters. This would appear to indicate that a feasible number of test organisms per ml. of test solution (corresponding to dish water) would be 100 times the highest counts found normally on food utensils. Records from U. S. Public Health Service mobile laboratories of food utensil plate counts made during the recent war in various areas of the United States indicate that high counts ranged from several hundred thousand to about 1 or 2 million bacteria per food utensil (usually glasses), as indicated by a standard swab-rinse plate count[27] procedure. Therefore, it appears that from about 1 million to 100 million test organisms per ml. would be a reasonable range for numbers of test organisms to correspond to actual practical conditions. Since it is known that the greater the number of test organisms, other conditions being equal, the longer the killing time,[3] lower counts would have a shorter killing time and would appear to give a false indication of the true effectiveness of the germicide under adverse conditions of heavy loads of contamination. A test solution containing 100 million bacteria per ml. of test solution would appear to correspond to a heavy load of contamination in dishwashing.

3. Volume of germicide-bacteria mixture

The volume of test solution was next determined. It was, of course, desirable from several points of view to have a small volume of solution. This would require less germicide, less water for diluting, fewer actual test microörganisms, and more convenient receptacles in which to carry out the tests. One of

the arguments for a large volume of test solution would be that of maintaining a high ratio of liquid to surface in order to reduce any adsorption of cationics to glass surfaces. Several reports have been made relative to the adsorption of cationics upon surfaces. DuBois [28] found from 17 to 31 per cent of certain quaternary ammonium compounds adsorbed to filter paper but it is indicated that lesser amounts were adsorbed to glass surfaces. Eckfeld and James [29] reported that in Petri plates, the quaternary was removed from the agar gel, and adsorbed onto the glass. When nutrient agar was spread over glass in an extremely thin layer, growth of *Staphylococcus aureus* was obtained, whereas in the thicker layers it was not. The results were explained as, "due to the adsorption of sufficient of the quaternary from the agar in close proximity to the glass to permit bacterial development."

In order to determine just how great the adsorption of cationics on glass was, a recently developed procedure for titration of quaternaries [30] was employed. It was observed by titration that when the amount of surface was increased greatly, by using large amounts of glass wool submerged in quaternary solutions, a considerable amount of quaternary (about 65 per cent) was adsorbed. This adsorption appeared to take place largely in the mesh of the glass wool where agitation could not diffuse it thoroughly. However, when 10 ml. portions of quaternary solutions (200 p.p.m.) were transferred serially through ten test tubes by both pouring and pipetting, from 98 to 100 per cent of the quaternary was recovered by titration.

It would appear that adsorption does take place and is of considerable significance where extreme ratios of surface to volume are maintained and where agitation is not great, e.g., with a mesh of glass wool, in agar media etc. On the other hand, if conditions are such that the ratio of glass surface to volume of solution is in the range which would be encountered in the ordinary handling of solutions for testing, indications are that with thorough mixing, losses of quaternary by adsorption will be of little significance. It would appear that adsorption of cationics onto glass surfaces would not be of such a magnitude or of such permanence that small samples (10 ml.) thoroughly mixed could not be used in a testing procedure. It is not indicated that this mixing needs to be extreme, but only that which would ordinarily be employed for obtaining a uniform bacterial suspension. In connection with the adsorption of quaternaries to glass [29] surfaces from agar, it is of interest to note that Quisno, *et al.*[31] (1946) reported that agar reduces the germicidal efficiency of quaternary ammonium compounds, and they suggest that this reduction is due to physical adsorption. Agar media have been relied upon to neutralize quaternaries in connection with certain types of testing procedures. However, other inhibitors appear to be more effective.[32, 33]

In connection with adsorption of cationics by surfaces, we have found that simply by forcing a cotton plug to the bottom of a test tube containing 10 ml. of a quaternary (200 p.p.m.), about 40 per cent was adsorbed immediately and little change was noted, even after standing for 24 hours. The use of cotton plugs, filter paper, and similar substances, in such a manner as to permit contact with quaternaries in a test solution, is not recommended. Glass caps are to be preferred for covering medication tubes.

4. Test organism in suspension versus test organism dried to glass surface

Since some investigators [14-16] have devised procedures in which the test organisms were dried on a glass surface rather than suspended in a solution, limited comparative studies were made using these two principles. Glass micro-

scope slides were dipped in a suspension of a test organism *(Escherichia coli)*, drained for 30 minutes at 37° C., and submerged for definite exposure periods in a solution of a quaternary. One hundred per cent kill was obtained in about the same exposure period as when approximately the same concentration of test organisms was employed, suspended in the germicide solution. The method in which the test organisms are dried on the surface of glass slides, has merit in "measuring the ability to kill organisms present on a surface in a film of organic matter."[15] However, it did not appear to lend itself as well as to the use of inhibitors for instantaneous neutralization of the quaternaries as did methods in which the test organisms were suspended freely in the germicide. Since exposure periods required to produce 100 per cent kill were approximately the same for both types of procedures, for simplicity, the one in which the test organism was suspended in the germicide was selected.

5. Selection of test organism

A variety of test organisms has been employed in proposed testing procedures. Generally, it has been observed that Gram-negative non-spore-forming bacteria (e.g., *Escherichia coli)* are more resistant to quaternaries than are Gram-positive microörganisms (e.g., *Staphylococcus aureus)*. The use of Gram-negative non-spore-forming test organisms would appear to be a good choice. Reports[3] indicate that cultures about 24 hours old show least fluctuation in resistance. Studies reported[12] show that *Escherichia coli* demonstrated resistance to quaternary ammonium compounds approximately equivalent to pathogenic organisms such as *Salmonella schottmülleri, Shigella dysenteriae,* and *Eberthella typhosa,* but there was no significant factor of safety. For most of our studies, a strain of *Escherichia coli*[22] used in other studies at this Station or of *Staphylococcus aureus* 209 was employed. A few other test organisms also were used.

6. Choice of end point

Frequently, in comparing germicides by the survivor-curve type of procedure, an end point of something less than 100 per cent kill is used, e.g., 99.9, 99, etc. Because, however, of the reported clumping and "agglomerating"[23, 24] we have selected 100 per cent kill. Selecting a lesser percentage kill did not appear feasible in view of reports which indicate that the death rate with quaternaries is not constant.

7. Temperature

Generally, temperatures previously employed for testing have been 20° C. We have used 25° C. since it appeared to be nearer to room temperature and might be considered to be about the lowest to which dish rinses would ordinarily drop. Also, 25° C. is generally easier to maintain during testing than is 20° C., especially where special water baths are not available.

8. Exposure times

Exposure times were selected as 15, 30, 60, 120, and 300 seconds. The selection of the shorter exposure periods was based on observations in the field showing the need of sanitizing food utensils within this time under certain practical conditions. Regulations[7] generally require that utensils sanitized by chemicals be exposed for 120 seconds. The 300 second exposure was designed[22] to give additional information on inferior compounds not effective in shorter periods of exposure.

9. Type of water

It has been reported[33] that the water in which a quaternary germicide is tested may greatly affect the germicidal efficiency. For this reason, in a given experiment a constant type of tap water

(or distilled, in a few instances) was employed for suspending the test organism as well as for diluting the germicide. No attempt was made to sterilize tap waters, in order to avoid possible changes. However, distilled waters, when used, were previously sterilized.

GERMICIDE TESTING PROCEDURE

Controls

Sterility control plates were made on all waters. Initial and final counts were made on bacterial suspensions to serve as a control for possible germicidal action of suspending waters as well as to establish the initial number of test organisms employed. All equipment, media, and reagents were sterilized; however, tap waters were used without autoclaving.

Preparation of germicide

Quaternary germicides were diluted in the water (dechlorinated with sodium thiosulfate, generally 0.1 ml. of a 4 per cent solution per 100 ml. of tap water) so that the concentration was double that desired for testing. Usually germicides were tested in the concentration recommended by the manufacturer, or in many instances with quaternaries, at 200 p.p.m. if no recommendations were stipulated. No attempts were made to adjust reaction, but the pH of a duplicate solution was determined.

Preparation of suspension

A standard 99 ml. milk dilution bottle[34] previously sterilized, was filled to the 99 ml. mark with the water to be used for the test, sodium thiosulfate[22] being added to neutralize residual chlorine. Approximately 5 ml. of this water was then delivered to the surface of a 24 hour 37° C. nutrient agar slant of the test organism (generally *Escherichia coli*). A twisted double-wire nichrome loop, with shaft 12 cm. in length, was used to loosen organisms from the agar slant and the entire contents were rapidly poured back into the 99 ml. dilution bottle.

After mixing[34] by shaking the bottle rapidly 25 times in a vertical 1 ft. excursion within 7 seconds, 5 ml. was carefully delivered to the bottom of a large test tube (25 x 150 mm.) which had previously been sterilized with a glass cap covering. Care was taken to avoid touching the walls of the test tube; *when the walls were touched, the tube was discarded*. For this purpose, 5 ml. tip-delivery bacteriological pipettes (e.g., blue line Kimble retested No. 37080) were employed. (The aperture of these pipettes was about 2 mm. in diameter).

This suspension contained generally about 200 x 10^6 organisms per ml., such that when diluted with an equal volume of germicide solution, approximately 100 x 10^6 organisms would be contained in 1 ml. of germicide-bacteria mixture. In some instances counts were higher, hence only a portion of the suspension from the agar slant was used for transferring into the 99 ml. dilution bottle previously described.

Test procedure

Solutions of germicides as well as bacterial suspensions were held in a 25° C. incubator (or water bath) when not in use, both before and during the test. At the beginning of a test, the medication tube containing the 5 ml. of bacterial suspension was placed in a beaker containing water at 25° C. Likewise about 10 ml. of the germicide (in a test tube) was brought to this temperature, and 5 ml. removed (using a 5 ml. pipette previously described). The pipette was carefully placed in the medication tube and held in a vertical position with the tip just above the surface of the suspension (the glass cap of the tube having been previously removed and placed in the bottom half of a sterile Petri dish until after removal of the 30 second test portion). As the sweep second hand of an interval timer reached

the starting time, the contents of the pipette were released in a manner such that a layer of germicide was formed over the culture. (Best results appeared to be obtained by holding both tube and pipette in the hands in a vertical position. This is important, since if complete mixing is obtained without splashing culture on the walls of the tube, all test organisms will have an equal exposure period to the germicide, and "skips" or other discrepancies will be reduced or eliminated.)

After discarding the pipette, the contents of the tube were immediately mixed by a "swirling" motion and the first test portion of 1 ml. was removed after 15 seconds with a standard 1.1 ml. bacteriological pipette and placed in a test tube (cotton stopper) containing 9 ml. of a lecithin solution and immediately mixed. (Care was taken to deliver rapidly by blowing the portion into the 9 ml. of lecithin inhibitor on the exact second stipulated.) Subsequent samples were removed after 30, 60, 120, and 300 seconds, thoroughly swirling the contents of the tube prior to removal of each test portion. (For most work a 9 ml. blank containing 20 mg. lecithin (asolectin) * in phosphate buffer was used. For dispersion of the lecithin, a ratio of 7 ml. tween 80 † to 1 gram of lecithin [35, 36] was maintained.)

Plates were prepared for each exposure period in both 1 ml. and 0.1 ml. aliquots (from the lecithin blanks) resulting in 10^{-1} and 10^{-2} dilutions,[34] and poured with tryptone glucose extract agar containing 100 mg. of lecithin [32] (asolectin in tween 80) per 100 ml. of medium. When *Escherichia coli* was employed as a test organism, cultures were incubated for 24 hours at 35–37° C. For certain other test organisms, longer periods of incubation were required.

Additional controls

Following the withdrawal of the 1 ml. portion at 300 seconds in order to check for surviving bacteria, an excess of lecithin (at least 40 mg. contained in 1 ml. of solution—in other instances, more) was added to the tube containing the germicide-bacteria mixture. A sterile swab (about 22 cm. in length) was inserted and the walls of the "medication" tube swabbed. The swab was removed to a Petri dish, the swab stick cut off just above the cotton (by means of an electrically heated, hot wire) [37] (Fisher Hot-Wire Glass Cutter), and the plate containing the swab poured with lecithin-tryptone glucose extract agar. Following this, the "medication" tube was poured with tryptone glucose extract agar (15 ml. containing only 75 per cent the normal water content). For *Escherichia coli*, violet red agar was occasionally substituted for identification, but generally tryptone glucose extract agar gave clear-cut results.

Discussion

Test procedure

Our results indicate good correlation between the plate counts made at 300 seconds, the bacteria surviving in the tube, and the bacteria adhering to the swab. It would appear that tests could be satisfactorily made by eliminating the additional controls after the laboratory worker becomes proficient in use of the testing method, although these controls do help to explain some discrepancies due to splashing of culture on the walls of the testing tube, etc. The swabbing technique may be used after exposure periods shorter than 300 seconds, if desired.

When *Staphylococcus aureus* was employed as a test organism, a ratio of lecithin to quaternary of 100/1 was maintained in the 9 ml. lecithin dilution blanks. This ratio was also maintained

* Asolectin obtained from Associated Concentrates, Inc., P. O. Box 1535, Atlanta, Ga.

† Tween 80 obtained from Atlas Powder Co., Wilmington, Dela.

for *Escherichia coli*, although lower ratios for this organism were sufficient to prevent bacteriostasis. The advantages of using small amounts of lecithin in the agar medium are described elsewhere [32]; care must be taken to maintain a pH near neutrality. By adding 5 ml. of a double strength germicide to 5 ml. of a double concentration of bacteria, there results single concentration of both germicide and test organism. Other ratios were considered but this appeared more satisfactory from the standpoint of simplicity and the standpoint of complete instantaneous mixing. Where efficiencies of quaternaries (or other germicides) are to be ascertained at higher temperatures, obviously only the germicide (not the bacteria) should be heated to the higher temperature previous to the beginning of the test; consequently the ratio of the volume of germicide to volume of bacteria suspension would need to be increased.

By the use of 5 ml. bacterioligical tip-delivery pipettes with a wide aperture (about 2 mm. in diameter, described previously), it is possible to release the volume of germicide onto the bacteria with such rapidity that mixing is reasonably complete. Time is thus available for "swirling" the tube before the 1 ml. aliquot is removed at 15 seconds. Ten ml. pipettes were found to be more difficult to use for delivering 5 ml. of quaternaries, since with the large air space above the solution in the pipettes and the reduced surface tension, dripping often occurred. Slow-delivery pipettes are not satisfactory.

Comparative studies using test procedure

In order to ascertain whether this test gives a fair estimate of what could be expected under practical application, limited comparisons employing a pure culture of test organims have been made with plate counts from swabbings [27] taken from sanitized utensils. In general, if a compound gave poor results by the survivor-curve method herein described, the counts on utensils sanitized in this compound were also high. Likewise, a compound appearing by this testing procedure to be efficient, was able to sterilize (with respect to non-spore-formers) utensils under actual conditions of application.

To evaluate the testing procedure and determine that it was not requiring too much or too little of a germicide, tests were made employing only 50 p.p.m. available chlorine.[7] An alkaline hypochlorite was selected [19, 20] since it is known that the germicidal efficiency of hypochlorites decreases with increasing alkalinity, and alkaline hypochlorites are the slowest of the hypochlorites (chloramines including chloramine T generally are even slower).[38] Sodium thiosulfate was used as an inhibitor. Under these conditions 100 per cent kills were obtained in about 30 seconds. This is within the limit set by the U. S. Public Health Service Code Regulating Eating and Drinking Establishments.[7] Years of experience with hypochlorite compounds would substantiate that this compound in the minimum concentration permitted (50 p.p.m.) is effective for utensil sanitizing. Chloramine T solutions of 200 p.p.m. available chlorine (approximately pH 8) gave 100 per cent kills under these conditions in 120 seconds. Hypochlorite tests were made in both distilled water and Cincinnati tap water, and chloramine T tests were made in distilled water. The germicidal efficiency of chlorine compounds as measured by tests made in finished chlorinated tap waters would not appear to be greatly different from results of tests made in distilled water.

In the evaluation of quaternary ammonium compounds by this testing procedure, our results from about 100 tests have been rather clear-cut and definite. The time required for a 100 per cent kill by this testing procedure would ap-

pear to be a fair index to the time required for sanitizing food utensils in the final germicide bath at the given concentration. No margin of safety would appear to exist. No compensation is made for any organic matter present; utensils should be free of organic matter before being exposed to germicides in the final rinse. Some types of organic matter present will reduce effectiveness of the germicide, especially with quaternary ammonium compounds and hypochlorites. Concentrations may be increased in an endeavor to shorten the exposure time required; however, in this connection, caution must be exercised as some discrepancies have been reported.[22] It would appear that new compounds proving to be satisfactory by this laboratory procedure should be closely observed under actual conditions of usage by means of the standard swab-rinse plate count procedure for food utensils.[27]

It has been reported [22] from comparative fundamental studies that when quaternaries are tested in waters of different types, germicidal efficiencies vary. We have been able to demonstrate this phenomenon by the procedure described herein and it is especially pronounced with some quaternaries combined with what are stated to be non-ionic detergents. For this reason and because at this time we do not have available a satisfactory chemical testing procedure for actually measuring the effective quaternary residual, it is recommended [33] that quaternary ammonium compounds be tested in the waters (not autoclaved) in which they are to be used under practical conditions. Autoclaving may precipitate substances which normally interfere with quaternaries. Generally, chlorinated finished water supplies should have a bacterial count sufficiently low so as not to interfere with testing.

Interpretation of Results

Generally we have found that in the recommended concentrations (usually about 200 p.p.m.) in local tap waters (Cincinnati and Norwood) employing *Escherichia coli,* some quaternary ammonium compounds give a 100 per cent kill in about 60 to 120 seconds, while other compounds are completely ineffective even after 5 minutes, or are only slightly effective, in that the "break" in the survival curve is just beginning at 5 minutes. Some compounds gave 100 per cent kills in 30 to 60 seconds in Cincinnati tap water, but in Norwood tap water the killing times were extended. However, when the recommended concentration of certain compounds was doubled it was possible to obtain in Norwood tap water kills in about 30 seconds. Slight variations in killing time have been observed. (Cincinnati tap water is a surface water; Norwood tap water is from deep wells.)

When *Staphylococcus aureus and Micrococcus caseolyticus** were used, killing times were substantially reduced. In distilled water, compounds tested have much shorter killing times than in tap waters, yet plate count controls indicate the distilled water (or tap water) has little or no effect in itself in reducing numbers of viable test organisms during the period of exposure in these experiments. It is possible, therefore, to test quaternary ammonium compounds and other germicides in such a manner that an inferior non-effective product would appear effective and acceptable, simply by choice of a susceptible test organism, by choice of a compatible tap water, distilled water, or buffered distilled water, by reducing the inoculum or by inadequate inhibition (depending upon the test organism).

Escherichia coli [22] (or other Gram-negative non-sporulating bacteria) would appear to be a good choice as a test organism since its resistance with quaternaries [12, 39] and other germicides has

* Secured through courtesy of Dr. W. L. Mallmann, Michigan State College, E. Lansing.

at least been reasonably comparable with pathogenic Gram-negative non-sporulating bacteria; it is more resistant to quaternaries than certain Gram-positive bacteria, and bacteriostasis is eliminated[32] with less difficulty by use of inhibitors with this organism than with some of the Gram-positive cocci. Also, *Escherichia coli* is reasonably easily identified for purposes of differentiating between survival of test organisms and possible contamination. There is, however, no reason why any type of culture might not be substituted in this procedure. The interpretations would vary accordingly.

Since *Escherichia coli* has been reported[12, 30] to have approximately the same resistance as certain Gram-negative non-sporulating pathogens, it would seem that a germicide, in order to be considered for use should effect a 100 per cent kill of a test organism (about 100 million per ml.) similar in resistance to *Escherichia coli*[22] in certainly not more than about 30 seconds at the concentration to be used when diluted in the water actually employed in sanitizing food utensils. If a germicide effects such a kill in 30 seconds, it would appear safe to assume that in actual food utensil sanitizing procedures an exposure of 2 minutes[7] would be satisfactory for ordinary non-spore-forming pathogenic organisms. Further testing with pathogenic bacteria, however, will indicate more exactly what these limits are. The 1½ minutes additional time, plus the fact that the load is probably maximum would appear to offer an adequate margin of safety. Compounds not effecting a 100 per cent kill in about 30 seconds would appear to require increased concentration if only a 2 minute exposure period is maintained. Undoubtedly, compounds requiring 5 minutes for a 100 per cent kill would be unsatisfactory in the concentration employed; even the slow-acting chloramine T solutions were effective in 200 p.p.m. in 2 minutes.

When interpreting end points with the survivor curve, care must be exercised not to be confused by organisms splashed on the walls of the tube and thus not properly exposed to the germicide. Repeat tests will usually clarify discrepancies. A test organism such as *Escherichia coli* may be easily distinguished from air contaminants. An occasional single colony on an otherwise sterile plate may be fished for identification and, if necessary, a repeat test made.

Germicides proving to be satisfactory by the laboratory procedure should be carefully observed by the swab-rinse plate count procedure[27] under actual conditions of practical application. Under practical conditions the "life" of a germicide may be effectively determined simply by removing some of the rinse after it has been used for dish sanitizing for a period, and testing it by this survivor-curve procedure.

In working with new types of germicides such as quaternary ammonium compounds with which there may be some question as to whether the apparent kill, as indicated by loss of reproductive powers when planted in a suitable medium, is only a bacteriostasis, there is considerable merit in withdrawing aliquots for plating after a very short period of exposure, e.g., 15 seconds. If it can be demonstrated that the organism is capable of reproducing when plated after 15 seconds' exposure, but not after 30 seconds' exposure or longer exposure periods, it would indicate that fewer survivors remain with time. On the other hand, if the initial plating is made only after complete kill has been obtained, there may be some question, particularly with an inexperienced worker, as to whether the medium will actually support growth and all bacteriostatic action has been eliminated. Actual presence of colonies on plates representing a very short exposure period serves as a control for bacteriostasis and gives

ample proof that the test organism was not omitted.

A plate count made after 15 seconds' exposure also has another value. It has been observed that by actual timing in railroad dining cars and in other food establishments in some instances food utensils were submerged in the germicide for only 12 to 15 seconds. Undoubtedly, however, the germicide adheres to the glass and exerts a certain degree of effectiveness for a period after being removed from the germicide bath. Thus, the need for germicides effective in very short periods of time is evident. Through the use of testing procedures such as we have described, effective compounds may be discovered.

SUMMARY

A laboratory procedure is described for evaluating practical performance of quaternary ammonium compounds, hypochlorites, chloramines (including Chloramine T), or other germicides used for food utensil sanitizing. This simplified procedure has been devised by incorporating or modifying essentials applicable from several procedures previously proposed by others. Only a small volume of germicide-bacteria mixture (10 ml.) is required. Tests are made at 25° C. employing equipment ordinarily available in any bacteriology laboratory. Standard procedures and media were adopted where possible.

Limited comparative studies indicate that the time required to give a 100 per cent kill employing a special strain* of *Escherichia coli* (or a test organism of comparable resistance) in a concentration of about 100 million per ml. in the water in which the specific compound is to be used serves as a measure of the exposure time required for sanitizing food utensils under comparable conditions of temperature and concentration of germicide. Inferior compounds failing to kill in the exposure time provided may be tested with higher concentrations if it is desired to find the effective concentration necessary. It would appear that really effective germicides for food utensils should exhibit their germicidal activity by completely killing the test organism under standard conditions as described in about 30 seconds, and with such germicides the longer exposure times required in actual food utensil sanitizing regulations should provide a margin of safety, assuming adequate cleaning of utensils and their freedom from non-compatible detergents.

* Cincinnati (U.S.Public Health Service) No. 198.

REFERENCES

1. Klarmann, E. G., and Wright, E. S. An Inquiry into the Germicidal Performance of Quaternary Ammonium Disinfectants. *Soap & Sanit. Chem.*, 22, 1:125, 1946.

2. DuBois, A. S. Dishwashing Sanitation. *Soap & Sanit. Chem.*, 21, 1:25, 1945; and 21, 2:42, 1945.

3. Buchanan, R. E., and Fulmer, E. I. *Physiology and Biochemistry of Bacteria*, Vol. II—Effects of Environment upon Microörganisms. Baltimore: Williams & Wilkins, 1930.

4. Rideal, S., and Walker, J. T. A. Approved Technique of the Rideal-Walker Test. *A.J.P.H.*, 3:575, 1913.

5. Ruehle, G. L. A., and Brewer, C. M. U. S. Food and Drug Administration Methods of Testing Antiseptics and Disinfectants. *Cir. No. 198*, U. S. Dept. Agr., 1931.

6. Stuart, L. S. N.A.I.D.M.-U.S.D.A. Report on Quaternary Ammonium Testing. *Soap & Sanit. Chem.*, 23, 9:135, 1947.

7. Ordinance and Code Regulating Eating and Drinking Establishments, Recommended by the U. S. Pub. Health Ser. (1943), *Pub. Health Bull.* No. 280, U. S. Govt. Ptg. Off., Washington, D. C.

8. Reddish, G. F. Limitations of the Phenol Coefficient. *Indus. & Engin. Chem., Indus. Ed.*, 29:1044, 1937.

9. Tobie, W. C., and Orr, M. L. Determination of Phenol Coefficients in Presence of Surface Tension Depressants. *J. Lab. & Clin. Med.*, 29:767, 1944; Potentiation of Germicides with Aerosol, O. T. *J. Lab. & Clin. Med.*, 30:741, 1945.

10. Cade, A. R., and Halverson, H. O. Germicidal Detergents, The Synergistic Action of Soaps on the Germicidal Efficiencies of Alkalies. *Soap & Sanit. Chem.*, 10, 8:17, 1934, and 10, 9:25, 1934.

11. Pressman, R., and Rhodes, J. C. Sources of Error in Germicidal Activity Tests with Quaternary Ammonium Compounds. *Soap & Sanit. Chem.*, 22, 4:137, 1946.

12. Ridenour, G. M., and Armbruster, E. H. Some Factors Affecting the Properties of Quaternary Ammonium Compounds as Sanitizers. *A.J.P.H.*, 38:504, 1948.

13. Cade, A. R. Revamping the FDA Method. *Soap & Sanit. Chem.*, 23, 4:138, 1947.

14. Mallmann, W. L., and Hanes, M. The Use-Dilution Method of Testing Disinfectants. *J.Bact.*, 49:526, 1945.

15. Johns, C. K. A Method for Assessing the

Sanitizing Efficiency of Quaternary Ammonium and Hypochlorite Products. *A.J.P.H.*, 37:1322, 1947.

16. Mallmann, W. L., DeKoning, P., and Zaikowski, L. Critical Study of Machine Dishwashing. *A.J.P.H.*, 37:390, 1947.

17. Rahn, O. Injury and Death of Bacteria by Germicidal Agents, *Biodynamica*, Normandy, Mo., 1945.

18. McCulloch, E. C. *Disinfection and Sterilization.* Philadelphia: Lea & Febiger, 1945.

19. Butterfield, C. T., Wattie, E., Megregian, S., and Chambers, C. W. Influence of pH and Temperature on the Survival of Coliforms and Enteric Pathogens When Exposed to Free Chlorine. *Pub. Health Rep.*, 58:1837, 1943. ***Reprint No. 2530.***

20. Weber, G. R., and Levine, Max. Factors Affecting Germicidal Efficiency of Chlorine and Chloramine. *A.J.P.H.*, 34:719, 1944.

21. Mueller, W. S., Seeley, D. B., and Larkin, E. P. Testing Quaternary Ammonium Sanitizers as Used in the Dairy Industry. *Soap & Sanit. Chem.*, 23, 9:123, 1947.

22. Butterfield, C. T., Wattie, E., and Chambers, C. W. Bactericidal Efficiency of Quaternary Ammonium Compounds, Report in Manuscript, 1948.

23. DuBois, A. S., and Dibblee, D. Death-Rate Study on a High Molecular Quaternary Ammonium Compound with *Bacillus metiens. Science*, 103:734, 1946.

24. McCulloch, E. C. The Real and the Apparent Bactericidal Efficiencies of the Quaternary Ammonium Compounds. *J. Bact.*, 53:370, 1947; False Disinfection Velocity Curves Produced by Quaternary Ammonium Compounds, *Science*, 105:480, 1947.

25. Quisno, R. A., and Foter, M. J. Errors in Compounding and Testing Semi-solid Products Containing Quaternary Ammonium Salts. *J. Bact.* 53:501, 1947.

26. Armbruster, E. H., and Ridenour, G. M., A New Medium for Study of Quaternary Bactericides. *Soap & Sanit. Chem.*, 23, 8:119, 1947.

27. A Proposed Method for Control of Food Utensil Sanitation (Subcommittee Progress Report). *A.J.P.H.*, 34:255, 1944.

28. DuBois, A. S. Bacteriological Evaluation of Cationic Germicides. *Soap & Sanit. Chem.*, 23, 5:139, 1947.

29. Eckfeldt, G., and James, L. H. Quaternaries vs. Phenolics. *Soap & Sanit. Chem.*, 23, 12:157, 1947.

30. Harper, W. J., Elliker, P. R., and Moseley, W. K. Quaternary Test, Sensitive Method for Testing Concentration of Quaternary Ammonium Type Germicides. *Soap & Sanit. Chem.*, 24, 2:159, 1948.

31. Quisno, R. A., Gibby, I. W., and Foter, M. J. The Effect of Agar Upon the Germicidal Efficiency of the Quaternary Ammonium Salts. *J. Am. Pharm. A.*, 35:317, 1946.

32. Weber, G. R., and Black, L. A. Relative Efficiency of Inhibitors for Quaternary Ammonium Compounds, using Various Test Organisms. In press: *Soap & Sanit. Chem.*, 24 (Oct.), 1948.

33. Quaternary Ammonium Compounds for Bactericidal Treatment of Utensils, Sanitary Engineering Division, U.S.P.H.S., (Statement prepared at the request of the Conference of State Sanitary Engineers Meeting in Washington, D. C., May 7–8, 1947) June 6, 1947.

34. *Standard Methods for the Examination of Dairy Products*, 1941. Amer. Pub. Health Assoc., New York, N. Y., 8th Ed.

35. Quisno, R., Gibby, I. W., and Foter, M. J. A Neutralizing Medium for Evaluating the Germicidal Potency of the Quaternary Ammonium Salts. *Am. J. Pharm.*, 118:320, 1946.

36. Weber, G. R., and Black, L. A. Inhibitors for Neutralizing the Germicidal Action of Quaternary Ammonium Compounds. (Abstract) *J. Bact.*, 54:44, 1947; In press: *Soap & Sanit. Chem.*, 24 (Sept.), 1948.

37. Buck, T. C., and Kaplan, E. A Sterile Cutting Device for Swab Vial Outfits Utilizing Wood Applicators. *J. Milk Tech.*, 7:141, 1944.

38. Charlton, D. B., and Levine, Max. Some Observations on the Germicidal Efficiency of Chloramine-T and Calcium Hypochlorite. *J. Bact.* 30:163, 1935.

39. Hoogerheide, J. C. The Germicidal Properties of Certain Quaternary Ammonium Salts with Special Reference to Cetyl-Trimethyl-Ammonium Bromide. *J. Bact.*, 49:277, 1945.

"It is, of course, obvious that a solid material foundation is an essential basis for a high civilization; but it is a basis, not a superstructure. Our tendency is to confuse one with the other, to mistake the foundations for the towers and turrets of the new city.

"There is a spiritual hunger in the world today that is not being satisfied by American exports. 'God knows we need food and coal to survive,' said a European delegate to Lake Success, 'but unless America can take the lead in providing a vital faith, in giving us a song that mankind can sing, all her exports will merely postpone the day of reckoning, and the world will die anyway.'" — Raymond B. Fosdick, *Rockefeller Foundation—A Review for 1947.*

Suggested Techniques for Inducing Navaho Women to Accept Hospitalization During Childbirth and for Implementing Health Education*

FLORA L. BAILEY, PH.D.
Tuscan School, Maplewood, N. J.

SOME interesting and valuable suggestions on the implementation of health education and medical procedures among the Navahos have been made by Alexander and Dorothea Leighton.[1] Since I agree with them that a sympathetic approach to this important problem is necessary, I should like to offer a number of additional suggestions based on my investigation of the beliefs and practices of the Navaho Indians pertaining to the reproductive cycle.† This material was gathered from three areas in New Mexico, namely the Ramah, Pinedale, and Chaco Canyon regions. Sixty-six informants, both men and women, furnished the data. The investigation was made with a view to laying the background for a better understanding of Navaho attitudes toward health and particularly toward the problems of childbirth. Hospitals which serve the Navahos, both government and private, have made efforts to inculcate certain health principles into the minds of those whom they contact but the extent to which they have been successful is undetermined. Recent figures estimate that perhaps 25 per cent of the women seek medical assistance during childbirth.

In analyzing the data, a considerable degree of homogeneity of belief was found to exist, with certain deviations of opinion surrounding the central pattern. Definite patterns of thought, however, could be distinguished throughout all the material. For example, Navaho beliefs and practices pertaining to the reproductive cycle are dependent upon mythological and religious sanctions. Pregnancy restrictions and behavior patterns for facilitating delivery are based on the premise that *like produces like*, or that an effect resembles its cause, and various forms of sympathetic magic are indulged in so that nature will be forced into the path which is desired. It was also discovered that there is a strong emotional response in relation to hospitalization and medical aid. Although many informants did not refer to hospitals, others expressed a violent feeling either for or against these institutions and even mentioned individual doctors by name, discussing them with strong feeling.

Because certain Navaho practices are sanctioned by mythology and reinforced

* This paper was presented before the Section on Anthropology of the American Association for the Advancement of Science at the One Hundred and Fourteenth Meeting in Chicago, Ill., December 26, 1947.

† The writer is indebted to Dr. Clyde Kluckhohn of Harvard University and Dr. Leland C. Wyman of Boston University for their encouragement and advice in the conduct of this study.

by ritual, they offer great resistance to change unless such changes can be made to fit the pattern of Navaho logic rather than that used by administrators of educational and medical programs. It is suggested, therefore, that medical workers and health educators accept without adverse comment the pregnancy restrictions and rules of conduct which are traditional with the Navaho. Then, using a pattern of logic which parallels that expressed in Navaho thought, they could present new restrictions and rituals based on modern medical knowledge which would assist the woman to achieve the desired result, namely, the safe and easy delivery of a healthy child.

Specific recommendations, based on these conclusions, have been proposed and will be presented here in conjunction with the native practices which can be used to reinforce or redirect the pattern.

It is of primary importance to gain the support and confidence of influential members in each family group if a program of health education is to be successfully implemented. Group decisions in matters of health are a common practice when a healing ceremonial is involved. There is considerable carry over, it is safe to venture, in decisions regarding hospitalization. There is little doubt that many women would welcome medical advice and assistance during pregnancy and childbirth if they had the support of older members in the family and heard favorable reports from those of their friends who had experienced hospital care.

One "singer" reported, "For a while, after one woman around here had gone to the hospital and come back with the news that they gave her something to put her to sleep and she had no pain with the baby, many women thought it was better to go to the hospital than to stay home." If, as a result of one woman's confidence and satisfaction, "many" women wish to make use of medical assistance, it should be a matter of principle for each woman receiving help to be sent away feeling secure and happy so that her enthusiasm would create support and confidence among her neighbors.

In explaining why women hesitate to make use of medical facilities the statement was made; "Women know what to do at home, and they don't know about hospitals, so they don't go to hospitals." This, according to Dr. Clyde Kluckhohn's analysis of Navaho thought patterns,[2] is a basic reaction closely linked with others by which they win security. Regarding unfamiliar human beings as threats the women withdraw and do nothing when confronted with a new and potentially dangerous situation. Facing such a situation, with which she feels unable to cope, the woman solves her problem by refusing to have anything to do with doctors. The medical staff, by anticipating this reaction, could prepare the way for a more constructive solution of her problem through field clinics, individual conferences, and educational procedures designed to reassure the patient through an explanation of hospital routine.

Even a white patient, entering a hospital for the first time, is confused and apprehensive if the routine has not been explained. How much greater must this apprehension be for a woman who enters an alien world where the language is strange, where nothing fulfils her expectations of how things should be done, and where she is liable to "ghost infection" (as the Navahos term the disease) if she comes in contact with articles previously used by those who have died there.

After orientation and reassurance have been given her, the staff of the hospital, or the visiting field worker, should continue to seek ways of reinforcing the woman's emotional security and peace of mind. The fear and

anxiety of pregnant women in connection with hospitalization could doubtless be reduced by encouraging early admittance, thereby lowering the mortality rate. Reports show that the majority of maternal deaths in the hospital are caused by a retained placenta since the women are so afraid to face an unknown situation that they arrive at the hospital only in time to die there. One young woman remarked, "If a baby doesn't come for two or three days they get scared and go to the hospital." This tendency to seek hospitalization only in an emergency, or if death is imminent, is not unusual. As a result, one hears such bitter reports as that which came from an older woman who had lost two daughters in childbirth at the hospital after each had successfully delivered other children at home. Obviously, in her opinion, there was only one deduction—the white doctors had killed her daughters!

Any effort made by health educators, therefore, to persuade women to seek hospitalization at the proper time would be valuable in that rumors of death due to the fault of the hospital would be minimized, and the fear which serves as an emotional block for some women could thereby be counteracted.

One anxiety, however, which might be exploited in persuading women to accept aid is the extreme fear of contact with the birth discharge. It is linked with the even greater fear of contact with menstrual blood. One man reported, "This blood is not as bad as menstrual blood but it will break the back or the breast." The "breaking" thus referred to is *arthritis deformans* for it is believed that deformation will result from contact with the birth discharge. Other ill-effects were detailed by a young woman as follows: "If a ghost-bird, or a bluebird, or a coyote eats it, the woman won't get well for a long time; she stops having babies; it gives the woman more pain; it kills the mother; the baby won't have any sense; it will cripple animals; and witches will get it." In the face of such formidable dangers which follow the improper disposal of the birth discharge, medical authorities might offer to relieve the woman of this responsibility, assuring her that if she comes to the hospital the nurses would take care of the disposal, thereby avoiding the possibility of exposing any of her family to contact with the blood and the resulting infection.

In dealing with patients during pregnancy, as well as after their admission to the hospital, it is important to phrase medical suggestions in terms of Navaho logic. For example: Navaho methods of keeping the fetus small, to insure an easy delivery, include hard work, exercise, and not sleeping in the daytime, as well as the magical application of certain medicines which work on the *like produces like* formula such as sucking honey from the pentstemon (called hummingbird's food) or eating a hummingbird's egg, shell and all, because this bird is so tiny. If the medical worker suggests other methods such as moderate exercise, the use of vitamins, or an increased calcium intake, he might explain them by using the Navaho phraseology, "It will make the baby strong, even though he remains small, so he will be born easily." It might also be pointed out that exercise keeps a person lean and in good condition, therefore it would, as they say, "keep the baby small."

There are certain parallels between Navaho and white medical practice which might be capitalized on by the hospital staff to expedite the delivery in a manner satisfactory to all concerned. Since the woman is accustomed to the native pattern of male assistants in the *hogan,* the presence of a male physician should be acceptable to her, and the Navaho practice of manipulating the abdominal walls in order to

secure a favorable presentation could be related to any similar manipulation which might be undertaken by the doctor. Both these patterns have mythological sanction, for Washington Matthews notes that abdominal manipulation to secure a favorable presentation was used by the two male gods, Talking God and Water Sprinkler, when they assisted at the delivery of Changing Woman and White Shell Woman.[3]

Native forms of modesty should be respected for a Navaho woman expresses her modesty in a slightly different manner from a white woman. That is, she does not consider exposure of the breasts an immodest act but places great emphasis on being adequately covered from waist to ankle. In their ceremonials women strip to one or two skirts and are very skillful in participating in events, even in the ceremonial bath, without exposing the lower part of the body. It is not strange, therefore, that hospital procedures involving a short bedgown and exposure during nursing care should be disliked. Manual examination should be undertaken with as little exposure as possible. However, since women are accustomed to a "singer" pressing and manipulating the body for ceremonial purposes, the doctor might minimize his problem by relating his examination to some such act with which she is familiar.

If internal version is indicated there is precedent in native practice for this also. Cactus salve is rubbed on the hands to make them slippery and the midwife then reaches into the orifice, using her hands as forceps, to deliver the child. However, one woman said, "It is a bad thing to reach in for the baby. I saw it done and it killed the woman." It should be explained to the patient, therefore, that under sterile conditions such emergency measures involve less danger than she anticipates in the *hogan*.

Navaho medical practices include the application of medicines externally and drinking of draughts during the period of pregnancy as well as at the onset of labor. Thus, any medicine which needs to be administered could be given with the explanation that it will, as the Navahos say, "help bring the baby easier," or "bring the placenta right away," or "stop the pain and clean out the blood." These are the results toward which their native medications are oriented and will, therefore, have meaning for them. No more than the exact amount, however, should be left where the patient has access to it, unless drinking a large quantity will make no difference, for the usual dose of native medicine is prescribed as "drink lots of it, drink one or two cups of that medicine."

If there is need for the use of diathermy, x-ray, or similar treatments these might be related to the healing properties of the sun prominent in Navaho ceremonial lore.

Since women are used to hot applications (made by heating the branches of juniper and packing them around the body) a parallel will be easily grasped, if heat needs to be applied, by using the Navaho cliché, "it will stop the pain."

If lacerations occur it is customary to use lotions, salves, or dusting powders. Steam baths, produced with water and herbs called Life Medicine, are also recommended. If similar treatments, ordered in the hospital, are tactfully introduced, objections might be avoided. Surgery, however, is not a native practice and this would have to be presented as a special technique used by white doctors.

A few days after delivery the woman takes a bath in certain herbs, including those called Life Medicine, to counteract the danger from contact with the birth discharge. It would be easy for a nurse to mention that the daily bath

water contained a kind of Life Medicine possessing purifying qualities, thereby easing the patient's mind.

If a woman does not have sufficient milk to nurse her child she may resort to artificial means of increasing lactation. This follows the familiar pattern of *like causes like* since liquids (particularly soups) are taken internally, and milkweed plants are applied to the breasts. On the basis of Navaho logic, therefore, the staff could introduce milk into the diet or, if desirable, force liquids. Certain other practices which have mythological sanction and therefore deep emotional significance for the parturient might be permitted, or even suggested, by the medical staff. If the doctor, for example, would advise the woman to have a Blessingway ceremonial sung for her, prior to entering the hospital, it would fall into a pattern which is familiar to her and make her feel that there was sympathetic coöperation between the white doctor and the native "singer."

The kneeling position, which the woman by tradition assumes for her delivery, has mythological sanction and is more in keeping with her sense of modesty than the modern obstetrical position. If the hospital could adapt its methods to allow delivery in the native position it might reduce emotional tension and prove valuable psychologically. Perhaps the dragrope, which in the legend was either a rainbow or a sunbeam, could be adapted for the woman's support, and certainly such small rituals as placing pollen ceremonially on the objects to be used, or applying pregnancy charms to her body, could do no harm. Corn pollen, sprinkled on a living horned toad at the moment it is born and then gathered, is always carried by a pregnant woman for use in this emergency. They say, "Take live pollen from the horned toad's babies and when the pains begin the woman takes a pinch and drops it inside her blouse because when the little toads are first dropped they can run away fast. They are strong." Mythologically the horned toad is protected against danger. For a nurse to suggest that the woman make use of such ritual assistance might easily serve to strengthen her feeling of security so that the subsequent ordeal would be eased.

Since the ritual act of *untying* plays an important part in native precautions at birth, if the woman were allowed to unbind her hair and remove her jewelry, and in cases of unusual emotional tension if the nurses would also make some gesture toward untying or unbinding their own persons, this would reinforce her morale.

The Navahos say, "No one should be around who gave any trouble to his mother at birth." Perhaps the hospital assistants could let it be known that they themselves had been born with great dispatch and little trouble. Anything that can be related to the *like causes like* formula would serve to bring reassurance.

That Navaho women find the smell of blood objectionable is evidenced by the fact that they use pungent herbs as an inhalant with the explanation that this will prevent fainting from smelling the blood. This may be partly psychological, related to the fear of contact with the birth discharge, but it would be easy to present the woman with a small bunch of sagebrush or a twig of wet juniper and might help her through a trying time. Familiar odors are known to be powerful stimulants to the emotions and would be gratefully welcomed in an atmosphere of strong, unfamiliar, and doubtless unpleasant odors.

One of the reasons women dislike hospitalization is that the food is unfamiliar and sometimes, to them, unpalatable. The food which the postparturient expects to receive imme-

diately after delivery is a ceremonial food sanctioned by mythology. It is a special type of blue cornmeal mush without the juniper ashes usually added to cornmeal breads. Any woman who has eaten mush ceremonially must eat it following childbirth. Where Navaho women assist in the hospital kitchens it should be possible to serve this specialty and thereby add to the patient's mental and physical comfort.

Since the woman is used to having the new-born baby close to her side it might be advantageous to let the infant remain near its mother in the hospital rather than to exile it to the nursery. This practice is not without precedent in certain modern hospitals where the philosophy of purely objective routine and seclusion for the infant has been replaced by one advocating closer physical contacts.

Molding or pressing the body of the new-born baby is believed to produce strength and beauty. This manipulation is based on mythology, being related to the pressing in the "Girl's Puberty Rite." Women who have had children born in hospitals say that the children did not develop normally due to lack of this ritual. One young mother said, "You press his forehead, and nose, and body to make him beautiful. My oldest girl was born in the hospital and they didn't do that to her, and her nose is little and her forehead sticks out." Certainly it would do no harm to suggest this ritual pressing and would satisfy a need.

Legend tells us, "It is thought the sun fed the infant on pollen, for there was no one to nurse it." This statement gives the sanction for the first food given to the child. Allowing the mother to offer a pinch of corn pollen to her baby would do him no harm and might do the mother considerable good. It might be practical, also, if the mother has enough milk, to allow her to nurse the child whenever it cries. This would follow a familiar native pattern yet would not be out of line with the newest practices in child care.

If the mother remains in the hospital until after the navel of the infant has healed it is important that the cord be given her to take home rather than discarded. The strong emotional tone in which the magical properties of the cord are discussed would indicate that coöperation in its proper ritual disposal would be appreciated.

When the mother and child are discharged from the hospital it is to be hoped that confidence will have been established between the medical advisor and the Navaho patient. Toward that end the preceding recommendations have been offered with the hope that they may point out specific ways of adjusting one culture to another and of lessening the tensions which are inevitable from such contacts.

REFERENCES

1. Leighton, Alexander H., and Leighton, Dorothea C. *The Navaho Door*. Cambridge, Mass.: Harvard University Press, 1944.

2. Kluckhohn, Clyde, and Leighton, Dorothea. *The Navaho*. Cambridge, Mass.: Harvard University Press, 1946.

3. Matthews, Washington. "Navaho Legends," *Memoirs*. American Folklore Society, Vol. 5, 1897, p. 231.

Results and Problems after Four Years of a Conservation of Hearing Program

WILLIAM R. WILLARD, M.D., F.A.P.H.A., AND DONALD F. PROCTOR, M.D.

Department of Public Health, Yale University School of Medicine, New Haven, Conn., and Department of Otolaryngology, Johns Hopkins Hospital, Baltimore, Md.

IN February, 1943, a program for the Prevention of Deafness in children was started in Washington County, Maryland. This was the first program of its kind, with an emphasis on medical treatment, financed by the Children's Bureau and conducted by a health department as one of its services for crippled children. This administrative study covers the first 50 months of operation. It is based on a review of the 1,084 clinic records and other information obtained in the county; 1,035 of the 1,084 records were sufficiently complete to tabulate.

DESCRIPTION OF THE AREA

Washington County in western Maryland is a typical American county in many respects. The population was 68,064 in 1940 (estimated as high as 73,130 during the war) with 2.5 per cent colored. About one-half of the county's population is in the City of Hagerstown; the rest is rural.

The county has an effective, stable County Health Department supported by city, county, and state funds. During the period of this study, the staff included a full-time health officer, 5 public health nurses and clerks. A medical stenographer and hearing technician, added when the program began, gave approximately half time to the program. There was no medical-social service worker or nursing supervisor, but the latter has been added since.

The Health Department building contained adequate clinic facilities. The county has a 158 bed hospital. There were about 50 physicians, including 4 ear, nose, and throat specialists (63 physicians and 6 specialists since the war). Relationships of the Health Department and medical profession have been excellent.

ORGANIZATION OF THE PROGRAM

The program required almost 9 months of preparation, devoted chiefly to planning clinic organization and conferences with most of the physicians in the county. A special meeting for the ear, nose, and throat specialists was addressed by the prospective clinician and a specialist from the Johns Hopkins Hospital. The program was endorsed by the County Medical Society, and the services offered have been used extensively by physicians of the county.

The following services were provided: (1) case finding; (2) a clinic for diagnostic ear, nose, and throat work, and radium treatment of adenoid tissue; (3) public health nursing service; (4) hospital, surgeon, and anesthetist services for those needing surgery but unable to pay for it; and (5) hearing aids for those unable to afford them. It was hoped that the Board of Education would develop speech reading, speech training, or other rehabilitation services but these have not yet been provided.

THE CLINICIAN

The clinician for such a program should be interested in hearing conservation, and adequately trained in management of clinical problems, use of the nasopharyngoscope, the administration of radium therapy, and the testing of hearing. It may be difficult to find a suitable clinician.

Our clinic was staffed for 3 years by an otolaryngologist on the clinical staff of the Johns Hopkins Hospital and Medical School, who had the advantages of good training and enthusiasm. Being an outsider who was not competing with the local medical profession, he maintained a neutral position with the physicians. When other responsibilities made it impossible for him to continue as clinician he was replaced by a resident otolaryngologist on the Johns Hopkins Hospital staff. Since that time, by special arrangement, the Hospital and Medical School have provided the services of a clinician from the resident staff.

This pattern has the advantage of insuring to the clinic competent medical services. It has the disadvantage that clinicians change each year, occasionally more often. This has not been a serious drawback, especially since the original clinician is now a consultant for the State Health Department and visits the clinic periodically.

Such experience is invaluable to the resident, enabling him for the first time to participate in a community medical program under supervised field conditions. It gives him also an appreciation and understanding of a public health program which too few physicians have.

It strengthens the position of the University Medical Center in the minds of the public and the medical profession by bringing service to those not otherwise having access to it. Also, it directs to the Medical Center a certain amount of clinical material valuable for teaching and research purposes.

This pattern has applications broader than those of a Hearing Conservation Program.

CASE FINDING

Cases were obtained by (1) referrals from teachers and nurses; (2) referrals from private physicians; and (3) audiometric screen testing of all children in the 3rd and 6th grades (about 2,800 children annually) and others selected for testing by teachers. Children were referred to clinic through the family physician if they had one, or by nurses or teachers if they were observed to have earaches or discharge, defective speech, poor behavior not otherwise explained, frequent colds, mouth breathing, chronic cough, or hearing impairment. The source of clinic patients is shown in Table 1.

TABLE 1

Source of Referrals of Clinic Patients

	No.	*Per cent*
Screening	269	26.8
Nurse	180	17.9
Teacher	77	7.7
Private physician	423	42.1
Others	55	5.5
	1,004	100.0

The records often did not state the ultimate source of referral, and it is possible that some children referred by screening or by nurses, should have been credited to teachers and vice versa. In some schools as high as 25 per cent of the children screened were referred by teachers from grades other than 3rd or 6th, and in other schools no children were so referred, pointing to the need for further educational work with teachers. The average was about 15 per cent.

Referrals from private physicians during the earlier years of the program were so numerous that it was difficult to see other patients who might be in greater need of service. To meet needs of patients with known hearing impairments or ear infections, it was necessary to use a priority system in scheduling appointments. One-third of all patients referred by private physicians were in

the preschool age, where the opportunity is greatest for doing preventive work by treating conditions predisposing to infection and impaired hearing. As care is provided for the backlog of neglected children in a community, preschool patients referred by private physicians become increasingly important.

Children were screened individually with a pure tone audiometer (Western Electric 2 A) frequencies 512 and 8,192 plus a spoken and whispered voice test. Tests were done in the schools using the quietest room available. Any child with a threshold loss of 25 or more decibels on either frequency was given a complete test. If the child had an upper respiratory infection the complete test was postponed for 4–6 weeks. Any child with a threshold loss of 25 or more decibels on any frequency on the complete test, except for a 4,096 dip, was referred to the clinic. Also, those without hearing impairment but thought to suffer from conditions predisposing to hearing impairment were similarly referred to clinic.

Table 2 shows that the number and per cent of children referred to clinic as a result of screening dropped sharply over a 3 year period. This downward trend is in accord with the experience of others. Much of the backlog of impaired hearing is identified rather quickly and then the findings reflect more nearly the annual increment of defects.

Of 368 patients who had a complete audiometric test prior to their first clinic examination, 190 or 53 per cent waited more than 3 months for their first examination and 65 or 18 per cent waited 9 or more months. In some instances the children who waited had rather severe hearing impairments. This delay is a reflection of several factors: (1) heavy demand for clinic appointments; (2) indifference on the part of some families; (3) inadequate attention to scheduling these children; and (4) inadequate follow-up.

Any program should provide a reserve audiometer to be used during a semi-annual recalibration of the regular equipment. Also, audiometers occasionally need repair and reserve equipment is important if occasional serious delays are to be prevented. Over 4 months were required recently to effect repairs in the audiometer; meantime the hearing technician could not do her work.

CLINIC SERVICE

The clinic was staffed by the clinician, medical stenographer, nurse, and audiometric technician. The nurse took a preliminary history on the patients, and the stenographer took dictation for the patients' records, and sent a report to the referring or family physician promptly after clinic was over.

The clinic operated on an appointment basis. Data are not available as to the proportion of broken appointments, but for some clinics they ran as high as 25 per cent and allowances were made in scheduling appointments. Patients seldom waited long at clinic and, due largely to the efficient preparation by the nurse and stenographer, the clinic has run smoothly and rapidly.

The clinician was equipped to do a

TABLE 2

Number of Children Screened for Hearing, Number and Per cent Referred to Clinic

School Year	*No. New Children Screened*	*Number Referred to Clinic*	*Per cent Referred to Clinic*
1944–1945	1,616	167	10.3
1945–1946	3,118	112	3.6
1946–1947	2,881	72	2.5
	7,615	351	4.6

complete office examination, including the use of an electric nasopharyngoscope, and to give radium treatment for adenoid tissue. X-rays were obtained by contract with the hospital (located in an adjacent building).

As expected, the proportion of return patients to new increased with the age of the clinic. For every 100 new patients 124 return patients were seen in 1943 in contrast to 430 in 1947. This was largely due to the desire to follow patients as long as possible even though no treatment was given. It is not known yet at what ratio this will level off. Return and new patients together required an average of 10 minutes per examination which is faster perhaps than most clinics could handle a patient satisfactorily. Twelve to 15 minutes would seem a more reasonable figure for planning purposes.

Two all-day clinics a month were held during the first two years. During the war there was some curtailment of service, but the original schedule has been resumed. Because of the backlog of accumulated neglect which can be found easily in any community which has lacked an ear, nose, and throat program, the load should be heavy during the early years of a program. An all-day clinic a week for the children from a county of 70,000 would not be too much at first.

By age the children attending clinic were well distributed, 17 per cent were of preschool age; 34 per cent were of age 6–9 years; 29 per cent 10–13 years; 9.7 per cent 14–20 years; and 9.7 per cent were 21 or above. The adult group was not eligible for service, strictly speaking, but staff members, physicians, and their families could not be refused, and some adults were seen in consultation. Logically, service for adults should be offered in such a clinic. The demand for adult service is great.

Males and females were seen in about equal numbers, as were rural and city children.

CLINIC FINDINGS

Although no attempt is made to evaluate therapy in this report, clinic patients have been compared on the basis of initial and final audiograms. Whereas only 28.6 per cent of 443 patients were found to have normal hearing on the initial examination (no loss exceeding 20 decibels on any frequency), 63.0 per cent were normal on the final audiogram. These figures are presented without regard to treatment received, duration under supervision or other factors. Had each patient received adequate treatment, the results might have been better.

It was judged that in 551 of 663 cases, or 83 per cent, the hearing impairment could be attributed to upper respiratory infections including otitis media. This is shown in Table 3.

TABLE 3

Etiology of Hearing Impairment

	No. Patients	*Per cent*
Conductive impairment		
Otitis media unclassified	551	83.3
Stenosis external auditory canal	7	1.0
Otosclerosis	4	0.6
Nerve deafness		
Congenital	15	2.2
Acquired	14	2.1
Meningitis	6	0.9
Unknown	66	9.9
Total	663	100.0

TABLE 4

Number and Per cent of Clinic Patients with Treatment Recommendations and Treatment Received

	Recommendations		*Treatment Received*	
	No.	*Per cent of all Clinic Patients*	*No.*	*Per cent of Those for Whom Recommended*
T & A	463	44.7	317	68.5
Hearing Aids	25	2.4	10	40.0
Mastoidectomy	9	0.9	3	33.3
Sinus Surgery	11	1.1	3	27.2
Submucous Resection	27	2.6	5	18.5
Allergy Consultation	43	4.1	14	32.6
Chest Consultation	10	1.0	6	60.0
Radium Treatment	461	44.5	461	100.0

TREATMENT RECEIVED

In Table 4, clinic recommendations and treatment received are tabulated. T & A and radium therapy were each recommended to about 45 per cent of the clinic patients and were secured in 69 per cent and 100 per cent of the cases respectively. This does not imply that 100 per cent received adequate radium therapy; merely that they received at least one treatment.

Radium is an acceptable form of therapy and comparatively few patients will drop out after just one treatment. Of 461 patients receiving radium, the largest number, 110, received three treatments; 161 received four or more; and 19 received six or more treatments.

Hearing aids were secured through the Baltimore League for the Hard of Hearing and each fitting necessitated several trips by the patient of approximately 65 miles to Baltimore. When necessary, the aid was purchased by the State Health Department with crippled children's funds. One was secured by only 10 out of 25 patients for whom it was recommended and in at least 3 instances, possibly 5, the aid was not used after it was obtained. This poor showing is in part caused by the difficulty of going to Baltimore and in part to inadequate interpretation, to the patient of his need, and lack of supervision in the use of the instrument. Provision of a hearing aid in itself does not solve the problem for many hard-of-hearing children.

It would be a substantial addition to the program if the technician were trained to help in selection of hearing aids, so that this could be done locally. More aids would be fitted and better service provided. However, this plan should be coördinated with the state voluntary agency for the hard-of-hearing, which may be prepared to render this service, but often is not represented in smaller cities or rural areas.

ECONOMIC STATUS

Services for crippled children of the State Health Department paid fees for hospital, surgeon, and anesthetist for patients who were certified by the County Welfare Department as eligible for care. Thirteen per cent of all clinic patients were certified as eligible.

In an effort to measure the relationship of economic status to the receipt of treatment, patients were assigned to 3 groups: (1) certified by the Welfare Department; (2) not able to pay; (3) able to pay. The assignment was made by the public health nurses according to their judgment, and not as a result of a financial investigation. The "not able to pay" group were believed to constitute a higher economic level than those "certified," and the "able to pay"

group represented largely those referred by private physicians.

As shown in Table 5, the *certified* group received a T & A when recommended in 81 per cent of the cases, the *able to pay* group 58 per cent, and the *not able to pay* group 43 per cent.

TABLE 5

Number and Percentage of Patients Who Received a Recommended T & A by Economic Status

Economic Status	*No. Recommended*	*No. Received*	*Per cent Received*
Welfare Dept. Certification	107	87	81
Not Able To Pay	230	99	43
Able To Pay	105	61	58

This suggests that the economic barrier may be serious in preventing patients from securing needed therapy. This conclusion is strengthened by an examination of policies governing certification. As is customary with welfare work, the patients must take the initiative and apply in person for certification at the Welfare office. It is well known that some persons because of charity implications in this procedure will not apply. Others are indifferent, and especially if they live at some distance, will not make the effort to be certified.

Although many factors were considered by the Welfare Department in determining eligibility, in general the following schedule was used:

Size of Family	*Maximum Income for Eligibility*
One	$1,525
Two	1,575
Three	1,725
Four	2,050
Five	2,350
Six	2,675

This scale in June, 1947, had not been adjusted since 1943, and with higher living costs, seemed much too low.

This points to the need for more flexible criteria which should be applied by a medical-social worker, preferably one integrally associated with the program.

NURSING AND MEDICAL-SOCIAL SERVICE

Nursing visits were made to help in securing corrections and for other services in connection with the program. With only 5 nurses (one per 14,000 population), each carrying a generalized program, it was inevitable that the intensity of service would be low. They visited only 27.5 per cent of patients enrolled in the clinic, but for each case admitted to nursing service an average of 3.4 visits were made.

A study was made of nursing visits relative to success in securing recommended T & A's, which showed that (1) a substantial number of patients for whom a T & A was recommended were not visited (usually the need for a T & A was not considered urgent in these patients); (2) there was comparatively little difference in number of visits made per patient to those who did and did not receive a T & A; (3) very few patients in the "able to pay" group were visited. Since most of these were private patients, this finding is not surprising in view of the shortage of nurses' service.

These figures emphasize the need for careful case studies by a medical-social worker as to why patients do not receive recommended therapy. There are factors blocking the receipt of therapy which the nurse alone cannot solve and with which a medical-social worker could help. It is probable that many of the fruitless visits to patients who did not receive therapy could be avoided, if these factors were clearly recognized. It is estimated that one-fourth to one-half the time of a medical-social worker could be advantageously employed in this program.

It is also clear that there is an unused opportunity to provide nursing service to private patients. To do this will require some education of the physicians, and good relationships between health department and physicians. It will also require more nurses, and a breaking of the local tradition that

nursing service is primarily for the poor.

It is estimated that the nursing hours devoted to this program, counting clinic and field time, were equivalent to one-third the time of a full-time nurse. It is further estimated that the equivalent of the full time of one nurse in this county of 70,000 would have resulted in adequate nursing service.

NEED FOR GENERAL MEDICAL SUPERVISION

For best results, patients under specialized care as in an ear, nose, and throat clinic should be under general medical supervision. This is emphasized by the fact that patients gave histories of the following conditions: Allergy, 68 times; heart disease, 19 times; tuberculosis, 5 times; suspicious bronchiectasis, 12 times; and other significant conditions, 45 times. Approximately 14 per cent of clinic patients gave histories of potentially important conditions outside the ear, nose, and throat.

No general medical supervision was available in Washington County except that provided by the private practitioner. Forty-two per cent of patients were referred by private physicians and presumably were under care, but in most instances the clinic had no official record of the physicians' findings. The other 58 per cent of the patients presumably were not under medical supervision. Such supervision should be provided by clinic service if necessary and adequate records of the finding should be available to the clinic.

RECORDS

Although it was assumed that the clinic kept good records, this study clearly demonstrated their inadequacy for administrative and research purposes. A study similar to the one reported here is the best way to reveal such deficiencies, and is useful in planning better records. Because there are many unknowns in the prevention of deafness, it is urged that all similar programs include administrative and clinical research as well as service. It is helpful in planning the records to define in advance some of the research problems to be undertaken. This is now being done in Maryland on a state-wide basis in conjunction with a revision of the *record form*.

REHABILITATION

The most conspicuous gap in the program at present is that of rehabilitation, especially speech reading and fitting of hearing aids.

The magnitude of this need can be estimated roughly from the data available. Had proper records been kept, a more precise estimate would be available. We know that 2.4 per cent of the clinic population was recommended for hearing aids. This proportion for the same age groups should gradually decrease as the preventive work continues.

By arbitrarily assuming that patients with a threshold of 35 or more decibels for 3 or more tones in the best ear need training in speech reading, it was calculated that 18 per cent of the clinic population needed this instruction judged by initial audiograms but only 10 per cent judged by the final audiograms. Thus, clinic attendance seemed to reduce the need for this service by almost 50 per cent, and probably the reduction would be greater if more patients completed recommended therapy. Ten per cent of the clinic population, age 6–20, is 76 patients who probably needed speech reading. If the number and age distribution of clinic admissions in the future approximate those of the past, 25 new patients a year would need speech reading.

Although it is recognized that there are many factors in addition to audiograms to consider in determining the need for speech reading for any child, it is believed that this calculation gives

figures useful for planning purposes.

In addition to these children, there were 39 children or 3.7 per cent of the clinic population with speech defects in need of speech training. Fourteen of these children had hearing impairments of 35 or more decibels with 3 or more tones, and all but 7 had some impairment.

Education departments are developing increasing interest in hearing problems of children. Many of them conduct extensive screening programs or are in a position to do so. It is important that health and education departments coördinate their programs so that duplication may be avoided, and so that each program will benefit from the activities of the other. The medical program should usually be conducted by the health department. The rehabilitation program involving speech training and lip reading usually should be conducted by the department of education, but certain phases of this work must be continually under medical supervision. The screening program in schools could be conducted by either department. If conducted by the education department, special arrangements must be made to reach children in parochial schools, and others not attending public schools.

A better quality of screening will result if a trained technician rather than a teacher or nurse does the work. It is suggested that in many communities the technician should be employed jointly by the health and education departments. Whether or not this is done, the program should be developed jointly by the two agencies. In many communities, as in Washington County, the health department clinic program will not keep a technician busy full time, and the rest of her time can be devoted advantageously to work in the schools. Obviously there is a real advantage in coördinating the school screening program with the clinic program through such a person.

A complete program for the conservation of hearing requires skills in medicine, surgery, and psychiatry, in testing hearing and selecting hearing aids, in the teaching of speech reading, in vocational guidance and education. Thus, many professional skills must be brought to bear in a coördinated fashion if patients are to receive maximum benefit. Large centers should be developed in which these skills are available and coordinated for the development of service programs and research. Such centers, serving the civilians as veterans are now served in certain veteran facilities, logically should be located in our medical schools. Programs like that in Washington County should be closely affiliated with such centers serving in a sense as their field outposts.

FINANCIAL ASPECTS

The budget for this program year ending June 30, 1947, was $7,040.20. This included $2,313.35 for the clinician's salary, and fees to surgeons and anesthetists for surgical care provided. It also included $560 for hospitalization. For the 6 months July 1–December 31, 1946, just under $2,500 was expended with a somewhat reduced clinic program.

For a more complete program, including the equivalent of a full-time nurse, the half time of a medical-social worker, and a share of the time of a nursing supervisor, the budget would approximate $10,000 for a county of 70,000 or about 14 cents per capita. To this should be added costs for rehabilitation estimated at $10,000, raising the per capita costs to about 28 cents per capita. If more liberal eligibility requirements for surgical care were effected, the cost might go as high as 32 to 34 cents per capita. Assuming an ideal program for this county at $25,000 a year, the average cost per patient admitted to clinic, would approximate $9.60.

Fees were charged for clinic examinations and treatment but only when it

was believed the patient could afford to pay them. No financial investigation was made, and it was usually the private patient who was charged. The fee was $5.00 for each clinic visit. Two hundred and seventy-three or approximately 25 per cent of all clinic patients paid such a fee. Only 11 patients who were billed failed to pay, and 3 of these paid partially. The minimum paid by any family was $2.50, the maximum $35. Of the families who paid, 53 per cent paid $5.00. A total of $2,609.75 was collected in 50 months, slightly more than $600 a year.

This suggests that in prosperous times, clinic service alone on a modest scale could be supported by fees, but the entire program requires other financial support. There is considerable difference of opinion as to the desirabliity of a health department collecting such fees. The Children's Bureau is opposed to such a practice. Practising physicians, believing in the fee-for-service principle, urge it.

GENERAL APPRAISAL

In spite of shortcomings, this program has contributed materially to the medical care available in Washington County. It has been a major step in preventive medicine directed toward chronic respiratory and ear infections. There are few medical problems today which approach these in magnitude.

The clinic has given, and continues to give, needed consultation service for all types of ear, nose, and throat problems, and has made available radium therapy for adenoid tissue. The program stimulated 2 local specialists to secure their own radium, and one of them received his training in its use in the clinic.

Physicians, teachers, and the public are somewhat more sensitive to problems of impaired hearing, and because the surgery on clinic patients done by local physicians usually is reviewed in the clinic, it is believed that the quality of work has been improved.

In short, this program has demonstrated in its field the practicability of providing specialized service and facilities available to, and used by, all economic classes of patients and many physicians. This has been done through the Health Department within the existing framework of private practice and not interfering with it. It is a pattern which is being increasingly used to bring to the people specialized services beyond the competence of the general practitioners but in a manner which the patient can afford, and which supplements rather than replaces the family physician.

Although this program is based on hearing conservation, in reality it is a generalized program for all ear, nose, and throat conditions. It would be well if the facts were recognized by calling it a clinic for prevention and treatment of respiratory and ear diseases, considering hearing conservation as one aspect only. These problems are not limited to children, and hearing impairments are more numerous in the adult than child population. The demand for adult services is great. The program should be broadened, as soon as financial support can be provided, to give services to all age groups.

Finally, it should be recognized that a specialized program like this will succeed best within an adequate public health program. The need for nursing and school health service, medical-social work, other clinics for consultation and for general medical or health supervision are so frequent and important, that the program is seriously handicapped without them. This point cannot be emphasized too much.

RECOMMENDATIONS

In reviewing the program the following administrative recommendations were made:

1. An extra audiometer should be available for use when the regular one needs repair or calibration.

2. It is extravagant to use a trained technician only half time on this program, and half time on clerical duties. There are so few trained technicians that full advantage should be obtained from her skill in the hearing conservation program either by screening school children in more grades, or by increasing the number of schools, serving adjacent counties if necessary.

3. School teachers should be given a better understanding of the symptoms of poor hearing among children, the significance of this program, and how to participate in it more fully. This is especially important in the case finding program, and in the handling of children with definite hearing impairments.

4. More prompt medical examination and closer follow-up is indicated for many children identified on screening examination as having impaired hearing, especially if the apparent impairment is large.

5. The services of a medical-social worker should be made available to this program.

6. A more flexible policy of eligibility for hospital and surgical care should be adopted and administered under the supervision of the medical-social worker.

7. A study should be made, with the help of the medical-social worker, of reasons why some patients fail to secure a hearing aid when one is recommended and others refuse to use one when secured. Although many of these reasons are self-evident, others are not and such a study would be educational to the staff.

8. Services equivalent to that of a full-time public health nurse should be provided for this program in a county of 70,000.

9. General medical or pediatric supervision should be provided for all patients served, either through clinic services or private physicians. Adequate records of their findings and recommendations should be available to the ear, nose, and throat clinic.

10. The clinic records should be improved to permit clinical and administrative research which can be conducted in such a program. The record form should be standardized in all similar clinics in the state conducted by the state health department.

11. For planning and coördination, an active advisory committee should be developed in which the health department, the board of education, the medical profession, the public, and all other interested groups are adequately represented.

12. The policy of collecting fees for clinic service should be reëxamined by the advisory committee.

13. The most conspicuous gap in the program which should be filled is that of rehabilitation, especially speech reading.

14. The generalized public health program should be strengthened, because a specialized program like this one will succeed better where the public health staff and services are more adequate for a complete public health program.

NOTE. The authors wish to acknowledge the coöperation and work of the Washington County Health Department Staff, especially Mrs. Myrtle White and Miss Frances Grove, in the compilation of data for this paper.

Abortion as a Cause of Death

CHRISTOPHER TIETZE, M.D., F.A.P.H.A.

Research Associate, National Committee on Maternal Health, Baltimore, Md.

ABORTION affects population growth in 3 ways: (1) In each case by terminating the current pregnancy before the fetus has attained viability, (2) in some cases by making the woman sterile and thus preventing further pregnancies, and (3) by causing the death of a certain number of women. This article is devoted to a discussion of the third aspect only. It is based almost entirely upon published statistics from several countries and has as its objective the appraisal of abortion as a cause of death.

The term abortion as used in this article should be understood as including all terminations of intrauterine pregnancy before the twenty-eighth week regardless of cause, that is to say unintentional, therapeutic, and illegally induced abortions. Deaths from septic and nonseptic abortion will be shown separately. This distinction is important because of the close association known to exist between illegal induction and fatal infection.

All data will be presented in terms of annual mortality rates per million women of reproductive age (15–44 years). This method of presentation has been adopted by the Registrar General for England and Wales, whereas the National Office of Vital Statistics of the United States still adheres to the traditional procedure of computing mortality rates from abortion per 1,000 live births. The fundamental objection against the latter method is that a mortality rate should show the number of deaths in relation to the population exposed to the risk of dying, but women who have carried their pregnancies to the point of termination by a live birth are precisely the ones who are not exposed to the risk of dying from abortion.

The mortality rate from abortion should not be confused with the fatality ratio of abortion. The latter can be computed from the number of deaths, if an adequate estimate of the number of abortions is available.

Table 1 presents the number of deaths assigned to abortion by the Bureau of the Census for each year from 1933 to 1945.[14] In 1933 the death registration area for the first time included the entire United States. The table also shows mortality rates per million women 15–44 years of age. For comparison, rates for 1927–1928 have been added based upon the special investigation into maternal mortality undertaken by the Children's Bureau.[18] This investigation included 15 states in all parts of the country. The population studied was slightly more rural than the United States as a whole but quite representative in its racial distribution and general level of maternal mortality.

To interpret correctly the numbers and rates presented in Table 1 it is necessary to consider the changes which have taken place in the classification of deaths from abortion. Prior to the Third Revision of the *International List of Causes of Death* adopted in 1920, deaths from abortion were not classified separately. They were included either with puerperal septicemia or with accidents of pregnancy, depending upon the presence or absence of infection. After 1920, nonseptic abortion appeared as

TABLE 1

Deaths from Septic and Nonseptic Abortion and Mortality Rates per Million Women, 15–44, in the United States, 1927–1945

Year	Number of Cases		Rate per Million Women	
	Septic	Nonseptic	Septic	Nonseptic
1927–1928 *	....	...	99	37
1933	2,037	640	67	21
1934	2,204	570	72	19
1935	2,167	602	70	20
1936	1,801	680	58	22
1937	1,531	582	49	19
1938	1,380	436	44	14
1939	1,393	393	44	12
1940	1,334	348	42	11
1941	1,014	370	31	11
1942	929	302	28	9
1943	789	376	24	11
1944	701	295	21	9
1945	587	301	18	9

* 15 states

a subdivision of the accidents of pregnancy, but the much more important group of deaths from septic abortion was not shown. For this period the only information on mortality from abortion is that contained in the Children's Bureau publication previously quoted.

The Fourth Revision of the *International List* adopted in 1929 included two classifications in reference to abortion: Abortion with septic conditions and abortion without mention of septic conditions. These two categories have remained in use up to the present time. It must be understood, however, that statistics classified under the 1929 list are not comparable with more recent ones for the following reasons: (1) Abortions reported as criminal were not classified as puerperal deaths but as homicides. (2) Deaths due to premature labor or to hemorrhage of pregnancy were assigned to nonseptic abortion. (3) Death certificates on which nonseptic abortion appeared in conjunction with toxemia of pregnancy, placenta previa, perforation of the uterus, and certain other terms were not assigned to abortion but preference was given to the other cause mentioned.

The Fifth Revision of the *International List of Causes of Death* adopted in 1938, and used in the United States since 1939, defined abortion as the termination of a uterine pregnancy prior to 7 lunar months or 28 weeks of gestation, retaining the division into abortion with and without mention of infection. Several changes were made in the lists of terms included under each title and in the rules for determining primary cause of death. As indicated above the results of these changes were the following: (1) Addition of criminal abortions previously classified as homicide. (2) Exclusion of premature labor and hemorrhage of pregnancy from nonseptic abortion. (3) Allocation of certain deaths to nonseptic abortion which under the rules of 1929 would have been assigned to toxemia, placenta previa, or other puerperal causes.

To make comparison possible throughout the series the mortality rates for the years before 1939 must be adjusted to the Fifth Revision of the *International List*. This adjustment has been made with the help of a special study published by the Bureau of the Census in 1944.[12] In this study the deaths of 1940 in the United States were classified according to both the Fourth and Fifth Revisions of the *International List* and cross-tabulated. From this cross-tabulation it appears that only 1,152 deaths

would have been assigned to septic and 331 to nonseptic abortion if the Fourth Revision had been used in 1940 against 1334 and 348 deaths under the Fifth Revision. To make the series comparable, the number of deaths and the mortality rates from septic abortion were therefore increased by 15.8 per cent for the period 1933–1938 and those from nonseptic abortion by 5.1 per cent. For 1927–1928 the mortality rate from septic abortion was increased by 10 per cent to allow for deaths reported as criminal abortion and classified as homicide. No adjustment is needed for nonseptic abortion because the investigation by the Children's Bureau included all cases of abortion listed in conjunction with other puerperal causes but excluded premature labor and hemorrhage of pregnancy.

The first two columns of Table 2 present the adjusted series of mortality rates per million women of reproductive age for the United States as a whole.

The usefulness of official statistics for the study of the mortality due to abortion has often been questioned and some authorities have felt tempted to discount them altogether. Is this attitude justified by the facts? A careful appraisal of the available evidence is necessary to answer this question. Deaths from abortion may be assigned to other causes for various reasons: (1) Abortions reported in conjunction with a nonpuerperal cause of death which takes precedence over abortion. Such cases numbered 133 in 1940 [4a] which is 7.9 per cent of the number assigned to abortion. Of these 133 cases, 21 were assigned to tuberculosis, 18 to appendicitis, 14 each to syphilis and accidents, 11 to chronic nephritis, 9 each to cancer, heart disease, and pneumonia, 6 to hernia, 5 to nonmalignant tumors, 4 to suicide, 3 to diabetes, 2 each to typhoid fever and pellagra, and 6 to a miscellany of other diagnoses. This list suggests that in many of these cases the abortion was listed either as a non-fatal complication of a fatal disease or as an unsuccessful therapeutic measure rather than the cause of death. (2) Deaths reported as due to a puerperal condition but without mention of the fact of abortion or the period of gestation. Such cases are assumed to have occurred in the third trimester of pregnancy and therefore not classified as abortions. Errors of this type were found fairly frequently in the early studies of maternal mortality in the United States. They amounted to 20.9 per cent of all septic abortions in the survey of 1927–1928 made by the Children's Bureau, to 15.7 per cent of all abortions in New York City in 1930–1932,[6] and to 14.9 per cent in Philadelphia in 1931–1933.[7] Unfortunately no further such investigations have been published in more recent years. It is believed, however, that the strong efforts made by health departments and by the special committees on maternal mortality established in many cities have resulted in much more accurate reporting of puerperal deaths than was customary 15 or 20 years ago. In this connection it is worth noting that in 1945 more than 78 per cent of all deaths from puerperal causes occurred in hospitals against 55 per cent in 1927–1928. (3) Deaths reported as septicemia or peritonitis without mention of pregnancy, childbirth, or the puerperal state. If such death certificates refer to women of reproductive age they are usually queried by the registrar and the complete diagnosis ascertained. Between the ages of 15 and 45 years, nonpuerperal septicemia appears more often as the cause of death for males than for females. It is therefore unlikely that many septic abortions are concealed under this diagnosis. For peritonitis of unknown origin, the Census Bureau regularly reports more deaths of women of reproductive age than of men. During the 3 year period 1942–1944

the average annual excess amounted to 100 female deaths. Of these, 40 occurred in white and 60 in colored women. A number of these deaths were probably caused by septic abortion. (4) A fourth group of deaths due to abortion but not reported as such are the cases where a false and apparently innocuous diagnosis is entered on purpose in order to conceal a criminal abortion. I do not believe, however, that this happens very often, especially in urban communities. As a rule a woman seriously ill after an illegal operation is not allowed to die in her home under the care of the abortionist or a conniving family physician but is taken to a hospital in an effort to save her. It is not possible to estimate the number of such concealed deaths. The late Frederick J. Taussig [10] tried to do it by arbitrarily allocating one-half of the excess mortality of females, 15–44, over males from respiratory tuberculosis, diseases of the circulatory system, and acute and chronic nephritis to abortion; but his attempt is now only of historical interest. Dr. Taussig later admitted [10b] that his estimate had been considerably too high.

The Registrar General for England and Wales recently [11] expressed the opinion that "there is no reason to suppose that the understatement of abortion on death certificates amounts to more than ten per cent" in that country. The data presented here suggest that coverage may be less complete in the United States. It is felt, however, that the official statistics include the great majority of all deaths from abortion. It should be noted that the mortality from abortion as reported is generally highest in those sections of the American population where omissions and errors may be assumed to occur most frequently. Furthermore—and this is most important—there is every reason to believe that the quality of death registration has improved a great deal during the last 20 years. The outstanding fact about mortality from abortion is the steady and sometimes precipitous decline which has been observed almost everywhere. The reality of this decline cannot be doubted, and the extent of the fall is in all likelihood understated by the official statistics.

Four general statements can now be made concerning the development of mortality from abortion in the United States as a whole: (1) From 1927 to 1945 mortality from abortion has decreased by approximately four-fifths—from about 150 to about 30 per million women of reproductive age. (2) Mortality from abortion has decreased at a steadily accelerating pace, the rate per million women having dropped 32 per cent from 1927 to 1933, 44 per cent from 1933 to 1939, and 52 per cent from 1939 to 1945. (3) Deaths from septic abortion have outnumbered deaths from nonseptic abortion throughout the period at a ratio of about 3 to 1. (4) During the last few years, mortality from septic abortion has decreased much faster than mortality from nonseptic abortion.

It is suggested that this development has been due to a combination of several causes. (1) Contraceptive methods have been improved and are more generally used than formerly. Fewer women, therefore, resort to illegally induced abortion. (2) Abortionists have become more skillful in avoiding infection. (3) Many lives have been saved by improved methods of treatment, especially by the use of sulfa drugs and penicillin.

Table 2 also presents mortality rates from septic and nonseptic abortion for the white and colored population of the United States. Three facts are strikingly evident: (1) Mortality from abortion has been much higher among colored than among white women. (2) It has declined much faster among the whites than among the colored.

TABLE 2

Deaths from Septic and Nonseptic Abortion per Million Women, 15–44, in the United States, 1927–1945, by Color (Adjusted Series)

Year	Total Population		Septic Abortion		Nonseptic Abortion	
	Septic	Nonseptic	White	Colored	White	Colored
1927–1928 *	109	37	..	...	..	..
1933	78	22	73	119	20	44
1934	84	20	79	119	17	39
1935	81	21	76	123	19	37
1936	67	23	61	114	21	38
1937	57	20	50	111	17	40
1938	51	15	44	104	12	36
1939	44	12	38	95	10	30
1940	42	11	35	93	9	25
1941	31	11	25	80	9	28
1942	28	9	24	65	8	22
1943	24	11	19	61	10	25
1944	21	9	17	58	7	24
1945	18	9	13	52	7	26

* 15 states

TABLE 3

Deaths from Septic and Nonseptic Abortion per Million Women, 15–44, in the Divisions and Regions of the United States, 1939–1941, by Color

Divisions and Regions	Septic Abortion		Nonseptic Abortion	
	White	Colored	White	Colored
New England	23	*	9	*
Middle Atlantic	27	143	7	17
East North Central	31	76	8	17
West North Central	39	75	8	*
South Atlantic	36	77	12	28
East South Central	43	86	14	32
West South Central	39	93	12	33
Mountain	55	*	16	*
Pacific	26	83	8	*
Northeast	26	143	8	17
North Central	33	76	8	21
South	39	83	13	31
West	34	83	11	*
United States	33	90	10	28

* Less than 15 cases

(3) These statements are true for septic and nonseptic abortions.

The available evidence, meager as it is, indicates that in the United States the incidence of induced abortion is lower among colored than among white women. It seems, therefore, that the shockingly high mortality rates recorded for the colored population are due to the poor caliber of the abortionists and to the general inadequacy of the medical services available to nonwhites.

In addition to the color differential, marked regional differences are found within the United States (Table 3). Among white women, mortality from septic abortion is lowest in New England, the Middle Atlantic States, and on the Pacific Coast. It is highest in the Mountain Division and generally high throughout the South. The pattern is similar for nonseptic abortion. As far as the colored population is concerned, mortality rates from septic abor-

tion show comparatively little variation with the exception of a very high figure observed in the Northeast. Mortality from nonseptic abortion is highest in the South.

Through the courtesy of Dr. Halbert L. Dunn the National Office of Vital Statistics has furnished the author with a tabulation of deaths from abortion by color, region, and size of community for 1945 (Table 4). This tabulation is based not on place of death but on usual residence. Total numbers of cases are small and our estimate of population is less reliable than one would like to make it. With these reservations the following observations are in order: Mortality from septic abortion appears to be on the same level in larger and smaller cities and only slightly lower in rural areas. This finding is at variance from the widely held belief that death from septic abortion is by far most common in the metropolis. Mortality rates from nonseptic abortion tend to be highest in the country and lowest in the large cities. Additional data covering several years will be necessary to test the validity of these observations.

Turning now to the international scene we find in Switzerland [9] the longest series of mortality rates from abortion. What makes this series particularly valuable is that a confidential death certificate has been used in Switzerland since the turn of the century. Unfortunately the series is limited to septic abortion. Mortality from this cause doubled between 1901–1905 and 1916–1920, rising from 38 to 81 per million women of reproductive age.

TABLE 4

Deaths from Septic and Nonseptic Abortion and Mortality Rates per Million Women, 15–44, in the United States, 1945, by Color, Region, and Size of Community

Color and Region	Number of Cases			Rate per Million Women		
	Cities 100,000+	Other Urban	Rural	Cities 100,000+	Other Urban	Rural
			SEPTIC ABORTION			
White						
Northeast	36	30	17	10	10	8
North Central	36	38	36	12	13	10
South	30	45	80	21	21	18
West	17	17	13	14	16	9
United States	119	130	146	13	14	13
Colored						
North and West	46	3	8	51	*	*
South	27	49	59	60	75	47
United States	73	52	67	54	57	47
			NONSEPTIC ABORTION			
White						
Northeast	18	19	14	5	6	7
North Central	13	23	23	4	8	7
South	9	14	40	*	7	9
West	5	12	17	*	11	12
United States	45	68	94	5	8	8
Colored						
North and West	20	7	2	22	*	*
South	10	15	40	22	23	32
United States	30	22	42	22	24	30

* Less than 10 cases

TABLE 5

Deaths from Septic and Nonseptic Abortion per Million Women, 15–44, in the United States, England, Prussia, and Germany, 1920–1945

	Septic Abortion			Nonseptic Abortion		
Year	*United States*	*England*	*Prussia*	*United States*	*England*	*Prussia*
1920	..	..	121	..	..	34
1921	..	..	121	..	..	35
1922	..	..	133	..	..	32
1923	..	..	132	..	..	32
1924	..	..	122	..	..	34
1925	..	..	112	..	..	27
1926	..	..	109	..	..	25
1927	109*	..	..	37*	..	..
1928						
1929	..	..	*Germany*	..	..	*Germany*
1930	..	..	..	..	..	..
1931	..	29	..	..	17	..
1932	..	31	93	..	17	17
1933	78	32	89	22	18	18
1934	84	37	82	20	16	14
1935	81	33	69	21	14	15
1936	67	29	64	23	13	13
1937	57	23	49	20	14	12
1938	51	23	37	15	13	10
1939	44	25	..	12	11	..
1940	42	16	..	11	11	..
1941	31	21	..	11	12	..
1942	28	24	..	9	8	..
1943	24	25	..	11	8	..
1944	21	25	..	9	7	..
1945	18	18	..	9	6	..

* 15 states

From this peak the rate has fallen 70 per cent to 23 per million in 1941–1945.

1901–1905	38
1906–1910	67
1911–1915	70
1916–1920	81
1921–1925	57
1926–1930	44
1931–1935	42
1936–1940	40
1941–1945	23

Freudenberg [2] and Nevermann [5] have studied the course of mortality from abortion in Berlin and Hamburg. Both authors report steeply increasing numbers of deaths between the early part of the 20th century and the years immediately after World War I. Their material, however, included deaths of nonresident women and therefore presents an exaggerated picture. The number of nonresident cases can only be estimated. If they are excluded, the combined mortality from septic and nonseptic abortion in Berlin and Hamburg probably ran to about 400 per million women of reproductive age in 1920.

Table 5 presents the available data on mortality from abortion for the United States, England,[1] Prussia,[8] and Germany [3] for the period from 1920 to 1945. The mortality rates from septic abortion are comparable throughout the table but whereas each series of mortality rates from nonseptic abortion is uniform their mutual comparability is limited by the different rules for determining primary cause of death used in each country. As Prussia included two-thirds of the population of Germany during the inter-war period it has been considered permissible to show the rates in the same column.

The following generalizations suggest themselves: (1) Mortality from septic and nonseptic abortion has declined in each country. (2) Mortality from septic abortion has been on the same general level in Germany and the United

States but seems to have fallen faster in the former country between 1933 and 1938. These were, of course, the years of the all-out population drive in Germany and strong efforts were made to suppress illegal abortion. (3) England had a much lower mortality rate from septic abortion in the 'thirties than either Germany or the United States, but decline has been slower and for the last few years her rates have been almost identical with those observed in America.

SUMMARY

The general picture of mortality from abortion in all countries studied is one of steady decline over the past 30 years. In the United States the rate per million women of reproductive age has decreased by about four-fifths from 1927 to 1945. It has decreased more rapidly for white than for colored women and is now nearly 4 times as high among the latter. In addition, marked regional differentials prevail. The actual level of mortality from abortion cannot be accurately determined but the downward trend is certainly real.

REFERENCES

1. England and Wales, Registrar General. *Statistical Review of England and Wales for the Year 1945.* London: H. M. Stationery Office, 1947 and earlier volumes.

2. Freudenberg, Karl. Berechnungen zur Abtreibungsstatistik. *Ztschr. f. Hyg. u. Infektionskr.*, 104(4): 529–550, 1925.

3. Germany, Statistisches Reichsamt. Die Bewegung der Bevölkerung in den Jahren 1938 and 1939. *Statistik des Deutschen Reichs*, Vol. 587. Berlin: Verlag für Sozialpolitik, Wirtschaft u. Statistik, 1942 and earlier volumes.

4a. National Committee on Maternal Health. *The Abortion Problem.* Baltimore: Williams & Wilkins, 1944, p. 6.

4b. *Ibid.*, p. 28.

5. Nevermann, Hans. Zur Frage der Mortalität durch Schwangerschaft, Geburt und Wochenbett. *Zentralbl. f. Gynäk.*, 52(37):2351–2357, 1928.

6. New York Academy of Medicine. *Maternal Mortality in New York City.* New York: Commonwealth Fund, 1933.

7. Philadelphia County Medical Society. *Maternal Mortality in Philadelphia, 1931–1933.* Philadelphia: Philadelphia Co. Med. Soc., 1934.

8. Prussia, Statistisches Landesamt. Die an Zufällen der Schwangerschaft, der Entbindung und des Wochenbetts (einschl. des Kindbettfiebers) in Preussen im Jahre 1926 verstorbenen Frauen. *Medizinalstatistische Nachrichten.*, 16(4):268–273, 1929 and earlier volumes.

9. Switzerland, Eidgenössisches Statistisches Amt. *Statistisches Jahrbuch der Schweiz 1945.* Basel: E. Birkhäuser, 1946.

10. Taussig, Frederick J. Abortion and Its Relation to Fetal and Maternal Mortality. *Am. J. Obst. & Gynec.*, 33(4):711–714, 1937.

11. United Kingdom, Ministry of Health and Home Office. *Report of the Inter-Departmental Committee on Abortion.* London: H. M. Stationery Office, 1939.

12. United States, Bureau of the Census. Comparison of Cause of Death Assignments by the 1929 and 1938 Revisions of the International List. Deaths in the United States, 1940. *Vital Statistics—Special Reports*, 19(14):153–277, 1944.

13. United States, Children's Bureau. *Maternal Mortality in Fifteen States.* Washington: Govt. Printing Office, 1934.

14. United States, National Office of Vital Statistics. *Vital Statistics of the United States, 1945.* Washington: Govt. Printing Office, 1947, and earlier volumes published by the Bureau of the Census.

Epidemiological Approach to Accident Prevention*

EDWARD PRESS, M.D., M.P.H.
Regional Medical Director, Children's Bureau, Social Security Administration, Federal Security Agency, Chicago, Ill.

MANY workers in the field of public health may be wondering why a health officer should be concerned with accident prevention. They may feel that most accidents are due to motor vehicles and that they therefore should be the concern of a state highway department. This is not true. In 1947, on the basis of preliminary estimates, there were only 32,000 motor vehicle deaths out of a total of 100,000 accidental deaths. During the same time there were 33,500 deaths due to home accidents.[1] Anything that affects the health and life of the people and is preventable is a concern of the health officer. The free access of health department personnel to homes makes them especially effective in combating home accidents.

Some may ask, "Why bother with occasional scattered non-communicable injuries that result from accidents? Certainly there is no epidemic of accidents at present."

That is a debatable question. We may well be in the midst of an epidemic of accidents at the present time as related to 100, 500, or 1,000 years ago. As our vital statistics on accidents do not go back more than 40 or 50 years, we cannot conclusively prove this. It seems obvious, however, that as we harness the forces of nature and convert them by technical advances into locomotives, automobiles, airplanes, explosives, skyscrapers, tunnels, submarines, etc., we are introducing more and more accident possibilities. For example, in the first 40 years of this century, deaths due to automobile accidents alone rose from zero to 26.2 per 100,000.[2] In the same way, deaths from airplane traffic have mounted, and so with each of the newer mechanical inventions. It is true that before the automobile, there were deaths from runaway horses and from collisions between carriages. Before that, primitive man occasionally slipped on the mountainside but accidents must have been less frequent and less hazardous than now. A leak in a gasoline tank on an airplane is fraught with much more danger than a leak in the feed bag of a horse. If a bow and arrow were accidentally discharged 1,000 years ago, much less damage was done than by accidental discharge of an ammunition dump or a shipload of nitrate today.

In other words, it is quite probable that in the natural history of accidents, the current prevalence does represent an epidemic. Just what constitutes an epidemic? Webster says an epidemic is "a rapidly spreading or widely prevalent attack of disease." Accidents are certainly widely prevalent. Exactly what is a disease? Is it only a bacterial

---

* Modified from an address presented at the annual meeting of the Association of State and Territorial Directors of Local Health Services at Lake Ozark, Mo., April 22, 1948.

Note: I wish to acknowledge gratefully the influence of some of the concepts of the universal effectiveness of the epidemiological approach as described in unpublished lectures of Dr. John E. Gordon.

or virus illness, or are heart disease, cancer, pellagra, diabetes, etc., also diseases? Of course, they are. Let us go back to Webster's unabridged *Dictionary* for another definition. A disease is "a condition in which bodily health is seriously attacked, deranged, or impaired." Accidents certainly attack, impair, and derange bodily health.

However, even if we do not have a relative epidemic of accidents at present, that does not mean that epidemiological methods do not apply or that they cannot be effective. Epidemiology is concerned with the entire natural history of a disease, and attempts to institute preventive measures during endemic, as well as epidemic times. You are all familiar with the epidemiological approach to such "orthodox" diseases as smallpox, plague, typhus fever, etc. More recently we are all beginning to see that this same approach can be effective for more "unorthodox" diseases such as heart disease, silicosis, cancer, congenital cataract following German measles, etc. Exactly the same approach can also be effective for accidents. What is more, it may be even more necessary for accidents, because we do not have the same latent incubation period nor as many drugs to cushion the ill effects. For example, if we happen to contact the agent producing syphilis we have 24 hours to use soap, calomel ointment, or other things to stop the damage. Even if we cannot stop the initial damage, we can fall back on penicillin. Our aim as an epidemiologist, however, is still primarily to stop the agent from contacting the host. If, on the other hand, in an accident we contact the agent, which could be a carelessly placed roller skate, which causes a broken back by precipitating a fall down stairs, our back is broken in two or three seconds. We do not have 24 hours to prevent it from getting injured. Once the back is broken, or the skull fractured, penicillin is not as effective in healing the broken bones as it is in healing the ravages of syphilis.

You can therefore see that the epidemiological principle of interrupting the agent in transit to the host, i.e., seeing that the roller skate did not get slipped on is, if anything, more urgent than seeing that the treponema of syphilis does not contact the host.

Another point favoring the epidemiological approach to accidental injuries is that in accidents it is easier to identify the agent and thus guard the host from contact with it. For instance, in the above example, it is vastly easier to see the roller skate at the top of the stairs than it is to see a microscopic spirochete lurking deep in the depths of a dark vagina.

How can we apply other basic epidemiological principles to this problem? These basic principles and methods of achieving them are given slightly different emphasis and description by different authorities but fundamentally they are the same. The grouping used here is based largely on recent unpublished lectures by Dr. John E. Gordon. The 4 chief principles are:

1. Determination of existing status and behavior of the disorder in the community or universe being investigated
2. Determination of causes related to the status of the specific disorder
3. Development of specific measures for adequate control
4. Evaluation of results that come from recommended procedures

Those are the principles. What are the methods of achieving these principles?

First, to determine the exact status and behavior of a disorder, we must collect the customary epidemiological data. What is its frequency of occurrence? How many per 1,000 or 100,000? What are the most common types of home accidents? How are they distributed as to age? What is the sex distribution? What type of home are they most frequent in?

This information may all be helpful

in determining the cause and there is no fundamental difference between this information and the type of information obtained in combating an epidemic of typhoid fever, food poisoning, yellow fever, etc.

Second, the determination of causes related to the status of a specific disorder. Here we make inferences from the epidemiological data gathered, in order to determine the cause. For example, if many accidents occur in bathtubs without handles for support or without rubber bath mats, that may be one of the main causes of this type of accident. If, however, these same unguarded bathtubs are safe for young adults but not for elderly people, then another and perhaps more important contributory cause may be inferred, i.e., the infirmity and physical instability of old age.

If electrocution deaths occur only where faulty or unlicensed wiring is present that may be the cause of this type of accident.

Thus, each of the more prevalent types of accidents may, by orderly inductive reasoning from an analysis of the surrounding factors, be attributed to certain causes. Once these causes have been established we may then proceed to the next step in the control of epidemics.

That is the third principle—the development of specific measures for adequate control of the disorder. To help us apply this to accidents let us carry our analogy further. In the more orthodox bacterial epidemics we are all familiar with the measures which help in control. They are primarily threefold: destroy the reservoir of infection; interrupt the agent in transit to the host; or, increase the resistance of the host.

Let us examine each of these more closely. First, the methods of destroying the reservoir of infection. We know that in the battle of agent versus host, if the reservoir of the agent is destroyed, it can no longer harm the host. If the agent, for example, is an old forgotten bottle of medicine that was drunk in lethal amounts by a youngster, it should have been discarded. If the agent is a red-hot, old-fashioned pot-bellied type of heating stove, perhaps it can be discarded and replaced by another less dangerous form of heating. Agents may be deficiencies as well as positive items; as in the case of pellagra. If the agent is the lack of lights or railings on stairways, the lack of hand supports on bathtubs, the lack of safe play areas, etc., these conditions should all be remedied.

Second, the methods of interrupting the agent in transit to the host. There is a definite similarity between measures used for stopping the typhoid carrier from transmitting the bacilli from his hands to your food, and stopping fire from an open fireplace, by a firmly fixed screen, from reaching a toddler creeping on the floor. There are many ways of keeping the agent away from the host. For example, a gate at the top of a stairway; a strong screen placed in low windows when open; keeping poisons, matches, knives, and other agents frequently causing accidents away from the susceptible host by placing them safely out of reach; etc.

Third, methods for increasing the resisitance of the host. The "herd immunity" can be increased by safety education and increased consciousness of accident hazards. Accident prone individuals may perhaps be made less accident prone by medical or psychiatric treatment. If necessary, a change to a less hazardous occupation could be made.

The fourth and final basic principle in epidemiology is the evaluation of results that come from recommended procedures. Methods for this would be no different from methods used in the more orthodox diseases. Incidence and

prevalence reports would be compared with those existing in other communities as well as with those in one's own community before the control measures were instituted. The supplementary essential of reporting to the public on the effectiveness of control measures must not be overlooked. This should be done in simple, non-technical terms that strike as near home as possible. The human interest elements should be emphasized.

What sort of specific things should a local health department do to combat accidents? They involve the various details that follow in a logical way from the approach outlined above. Many of the specific duties appropriate for each staff member have been described in various publications during the past few years[3-8] and therefore need not be repeated here.

What can you as directors of local health services do in accident prevention? First, you can encourage and advise local health departments to initiate or extend their efforts especially in home safety, in an organized epidemiological fashion. Second, at a state level you can encourage initiation and expansion of similar activities. After all, most states have separate departments for venereal disease, nutrition, communicable diseases, etc. In 1944 more people died in the United States as a result of accidents than as a result of the common communicable diseases, venereal disease, nutritional disease, acute rheumatic fever, and diseases of pregnancy, puerperium, and childbirth, all combined.[9]

SUMMARY

Accidents have been shown to be a widely prevalent scourge on the health of the people; they are to a very large measure preventable; they are susceptible to attack by the epidemiological approach; and especially in the case of home accidents they are in the province of the health department. It is the health departments that have free access to the home; that have a responsibility for factors affecting the health of the people; and especially, it is the health departments that have the know-how of the epidemiological method.

REFERENCES

1. James, W C., Director, Statistical Division, National Safety Council, Personal Communication.

2. Linden, Forest E., and Grove, Robert D. U. S. Department of Commerce, Bureau of the Census, *Vital Statistics Rates in U. S. 1900–1940*. Washington, D. C.: Gov. Ptg. Office, 1943.

3. Godfrey, E. S., Jr. Role of the Health Department in the Prevention of Accidents. *A.J.P.H.*, 27: 152–155 (Feb.), 1937.

4. Subcommittee on Accident Prevention of the Committee on Administrative Practice of the American Public Health Association. Accident Prevention Engages the Attention of State Organizations, *The Spotlight*, Jan., 1944.

5. Accident Prevention—An Essential Public Health Service; Program Developed by the Subcommittee on Accident Prevention, Committee on Administrative Practice of the American Public Health Association, *A.J.P.H.*, 35:216–218 (Mar.), 1945.

6. Armstrong, D. B., and Cole, W. G. Accident Prevention, *A.J.P.H.*, 36:869–874 (Aug.), 1946.

7. Dukelow, D. A. What a Health Department Can Contribute to the Home Safety Program. Reprinted from the *Transactions of the 34th National Safety Congress for the American Public Health Association*. New Jersey State Department of Health, *Pub. Health News*, 29:14–19 (Jan.), 1948.

8. Taber, Elsie A. Role of School Nurse in Safety Education, *Pub. Health Nurs.*, 39:196–198 (Apr.), 1947.

9. Vital Statistics—*Special Reports*, U. S. Department of Commerce, Bureau of the Census, Vol. 25, No. 8, cited by Press, E. The Accident Problem. *J.A.M.A.*, 135:824–827 (Nov. 29), 1947.

American Journal of Public Health
and THE NATION'S HEALTH
Official Monthly Publication of the American Public Health Association
Volume 38 October, 1948 Number 10

Editorial Board
REGINALD M. ATWATER, M.D.
Chairman, and Managing Editor
LEONARD GREENBURG, M.D. STUART MUDD, M.D.
PROFESSOR JOHN M. HENDERSON RAYMOND S. PATTERSON, PH.D.
RALPH S. MUCKENFUSS, M.D. GEORGE ROSEN, M.D.
C.-E. A. WINSLOW, DR.P.H.
C.-E. A. WINSLOW, DR.P.H., *Editor* AUGUSTA JAY, *Editorial Associate*

THE PROBLEM OF REHABILITATION

ONE of the most significant advances made in medicine during the post-war period has been the increased recognition given to medical rehabilitation as an integral part of medical care. Satisfactory job placement is the capstone of any successful vocational rehabilitation program; but medical rehabilitation, starting at the earliest possible moment following acute illness or injury, is its foundation. All subsequent rehabilitation processes must be built upon that residual physical disability which medical treatment cannot eliminate.

The fact that vocational rehabilitation and medical rehabilitation are interdependent and inseparable, has been demonstrated by the successful programs in military and veterans' hospitals, and has been recognized in the civilian field by the enactment of the Barden-LaFollette Amendment, which expanded the Federal-State Vocational Rehabilitation programs to include physical restoration and medical care.

Although the focus of attention has been centered on the disabled veteran, the extent of disability among our civilian population is far greater. There were 19,000 amputations among military personnel during World War II, but over 120,000 major amputations during this same period among our civilian population. Approximately 1,500 men were blinded while in military service during World War II, but 60,000 civilians lost their sight during the same period. Some 265,000 men were permanently disabled as a result of combat injuries during the war, but 1,250,000 civilians were permanently disabled by disease and accidents during the corresponding four years.

The National Health Survey conducted in 1935 led to the estimate that 23,000,000 persons in the United States are handicapped to some extent by disease, accident, maladjustment, or war. Later reports, based on smaller but probably more scientifically chosen samplings, have indicated that disability resulting from chronic disease is even more prevalent. In a recent survey in New Haven, Conn., conducted by the Yale University Department of Public Health, it was found that 121 persons out of each 1,000 in the population surveyed suffered from chronic illness, and that one-third of this number were totally disabled. Today, as medical science moves forward in the prevention and cure

of infectious disease, chronic illness with its resulting physical, emotional, social, and vocational disability, is becoming one of the nation's primary health and welfare problems.

That rehabilitation pays economic as well as social dividends, has been amply demonstrated by the military services, the Veterans Administration, and some model civilian programs. During 1944, 43,997 persons underwent rehabilitation under the joint Federal-State Vocational Rehabilitation programs. Of this group, 22 per cent had never held jobs, and 90 per cent were not employed at the time they started rehabilitation. Their average annual wage after rehabilitation was $1,768, as compared with $148 before. Many had been on public assistance at a cost of $300 to $500 annually, but the cost of their rehabilitation was but $293 per case, a single rather than an annually recurring expenditure.

That rehabilitation is possible even with many of the aged chronically ill, has been shown by a study of 130 chronic neurological patients in the Veterans Administration Hospital at Minneapolis, Minn. All but two of this group were World War I veterans, and many had not been out of bed for 10 years. After 9 months of medical rehabilitation, 25 had left the hospital and were employed, 40 others had been discharged to their homes capable of light work, and of those remaining, 30 were ambulatory and undergoing advanced rehabilitation, and 25 were capable of some self-care. All but 10 of the group had shown significant, permanent improvement. With a 5 year life expectancy for these patients, and a patient-day hospitalization cost of over $12, rehabilitation of this one group alone has saved the government over $1,250,000.

In the civilian field, rehabilitation, in varying degrees, has been available in some tuberculosis, mental, and other specialized hospitals, but little provision has been made for rehabilitation and dynamic therapeutics for the 14,000,000 persons who are patients in general hospitals each year.

The first comprehensive, total, medical rehabilitation program in any community hospital in this country was started at Bellevue Hospital in New York a year ago. Operated under the professional direction of the Department of Rehabilitation and Physical Medicine of the New York University College of Medicine, the service has bed facilities for 80 patients, and offers a program of physical medicine, physical therapy, occupational therapy, corrective physical rehabilitation, social service, corrective speech, psychological service, vocational guidance, education and planned recreation. It provides service to the other departments of the hospital in much the same manner as the x-ray and laboratory, and treats both inpatients and outpatients on reference from other services. This rehabilitation service in Bellevue Hospital, which will be enlarged to 600 beds when presently planned construction is completed, is the first step in a plan by the Department of Hospitals of the City of New York to provide all patients in municipal hospitals of the city with medical rehabilitation services.

The extent to which rehabilitation has entered into future planning in New York City in both public and private hospitals, is shown by a report of the Hospital Council of Greater New York, in which it was suggested that 25 per cent of the bed capacity of the city's general hospitals should be allocated for convalescence and rehabilitation. This would mean one such bed for each 1,000 of the city's population.

The Health Officer is an indispensable member of the rehabilitation team. Probably his most important role is in public and professional education as to the therapeutic possibilities offered by rehabilitation. He has a primary

part to play in case finding and in correlating all community and health resources into a unified program.

During the past several decades, the field of preventive medicine and the practice of medicine, surgery, and public health have made tremendous advances. Ironically, those advances, by delaying death, have created the need for a new "third phase of medical care"—rehabilitation—to meet the responsibility which Dr. Edward L. Bortz, President of the American Medical Association so aptly summarized when he said, "The society which fosters research to save human life, cannot escape the responsibility of the life thus extended. It is for science not only to add years to life, but, more important, to add life to the years."

THE FIRST WORLD HEALTH ASSEMBLY

AN important milestone in the history of public health was the first World Health Assembly of the World Health Organization, which met at Geneva on June 24, 1948. It will be recalled that the remarkably broad and inspiring Constitution of the WHO was drawn up at the New York International Health Conference in the summer of 1946. The World Health Organization came into official existence on April 7, 1948, when the necessary 26 nations had notified the Secretary-General of ratification of this constitution. At the Geneva meeting in June, delegates or observers from more than 70 participating countries were in attendance.

The United States (represented by Thomas Parran, Martha M. Eliot, and James R. Miller as official delegates, with a large staff of alternates and advisers) found itself in a somewhat difficult situation. The Rules Committee of the House of Representatives, in its long delayed reporting of the bill authorizing our membership, tacked on two ill-mannered and objectionable amendments. The first of these reserved the right of the United States to withdraw at any time on a one year notice; the second, limited the financial contribution of the United States, with unfortunate results which will be noted in a succeeding paragraph.

The reservation with respect to possible withdrawal of membership raised serious legal problems. No other nation had made any such stipulation. The United States was, however, at once granted full rights as a member, subject to final decision of the Assembly; and when the matter of the validity of the qualified ratification of the Constitution by the United States came up in the 10th plenary session, Sir Wilson Jameson of the United Kingdom opened with a brief statement accepting the validity of our ratification. He was followed by Sir Dhiren Mitra, a legal adviser to the High Commissioner for India in the United Kingdom, who also accepted the validity of the ratification from a legal point of view. At this point, Dr. Parran made a brief speech pointing out the great interest of the United States in the World Health Organization, quoting from the President's release at the time he signed the Act ratifying the WHO Constitution. The President of the Assembly then recognized the Chief Delegate from the USSR who referred to the legal problem raised, but after some discussion moved that the United States be accepted as a full member of the World Health Organization. The adhesion of the United States was thereupon accepted by general acclamation. From this time on there was no further question as to our full membership and desire to coöperate completely; and this unfortunate episode may be considered as closed.

The main business of the Assembly was the consideration of a report by the Interim Commission appointed at New York, under the very able leadership of Dr. Andrija Stampar of Yugoslavia; and Dr. Stampar was elected President of the World Health Assembly to serve until the next meeting of that body. He presided with the forcefulness and fairness which we all associate with his distinguished personality.

The nations elected to the Executive Board for actual administration of the WHO program were Australia, Brazil, Byelorussian Soviet Socialist Republic, Ceylon, China, Egypt, France, India, Iran, Mexico, Netherlands, Norway, Poland, Union of South Africa, Union of Soviet Socialist Republics, United Kingdom, United States of America, and Yugoslavia.[1] The Executive Board elected Sir Aly Tewfik Shousha Pasha of Egypt as its Chairman. Dr. Brock Chisholm of Canada (who has served as director of the Interim Commission) was elected Director-General of the World Health Organization. No better choice could possibly have been made. Permanent central headquarters were established at Geneva; and six regional offices are contemplated, in the Eastern Mediterranean and Western Pacific regions, Southeast Asia, Africa and Europe (the last-named to render temporary service in war-ravaged countries). It is, of course, hoped to complete negotiations for integrating the Pan American Sanitary Bureau and the Pan-Arab Sanitary Bureau at Alexandria within the framework of the WHO. In this emphasis on decentralization, the new Organization is far superior to that of the League of Nations.

In general, the spirit of the Assembly reached a high plane of generous and whole-hearted coöperation; and we, as public health workers, may feel proud of the harmony and the enthusiasm which prevail in this area of international comradeship. Dr. Martha M. Eliot reports "at the First Assembly the program of action was finally adopted without dissent. The committee that formulated it was a 'committee of the whole' on which every nation was represented. When different views were expressed from the floor, 'working parties' were appointed. Usually these working parties were made up of those countries whose views were at variance, together with a few neutrals. Solutions to problems were as a rule promptly found, though, in a few instances, negotiations took both time and patience. In no case, when the matter under discussion related to health service or technical policy, was there an impasse. Only occasionally was a vote necessary in any 'committee of the whole' or in the plenary sessions, and, in such instances, the will of the majority was accepted without question."[2]

The program adopted by the Assembly gave top priority to six major problems—malaria, maternal and child health, the control of tuberculosis, and of the venereal diseases, environmental sanitation, and nutrition. In these fields, substantial budget allotments were made for staff and travel costs which would make possible, not only investigation of basic problems but also direct assistance to governments, at their request, in the form of expert advice, demonstration teams, and training programs. Public health administration (including public health nursing), parasitic diseases, virus diseases, and mental health were given a second grade of priority, each to be represented by at least one staff member and a small committee of experts.

All in all, the First World Health Assembly was an inspiring success. The

[1] Only three nations in the Western Hemisphere are included because only 8 out of 22 nations in this hemisphere had ratified the Constitution at the time of the Assembly.

[2] *Survey Graphic*, Sept., 1948.

only limitation on its future usefulness is a financial one—a problem created by the second reservation in the Act of Congress providing for our ratification. This Act fixed a limit of $1,920,000 on the annual contribution of the United States—again a unique reservation, since no other nation had protected its pocketbook by similar action. The WHO voted to accept as its scale of proportionate financial support by various nations the scale established by the United Nations which calls for a contribution of about 38 per cent of the total world budget by the United States. This has been agreed upon as a reasonable arrangement for the year 1949, but it was decided to review the scale of contributions before the budget for the year 1950 is adopted. While prosperous peoples furnish more dollars under such a plan, it is no more onerous for the United States to provide $38 than for many peoples to provide $1. The total budget will most certainly, therefore, be kept by the Assembly within reasonable bounds, since all are equally interested in economy.

The establishment of $1,920,000 by the United States automatically freezes the total budget of the WHO at $5,000,000. This is quite reasonable for the moment, providing all the money which could be spent wisely for the first year. It is obviously inadequate for future developments. It is no more than the health budget of a single large city. It cannot suffice to finance a fully developed central organization, half a dozen regional offices with research and working parties, and a training program. We do not believe that any citizen of the United States will hesitate to contribute one three-cent postage stamp a year to the cause of world health, which would more than double the limit set by Congress. The establishment, in advance, of a ceiling for our contribution should be eliminated by future congressional action.

THE HEALTH RECORD OF THE EIGHTIETH CONGRESS

THE Congress which has recently expired (unless another special session is called this fall) has been described as the "worst" and "best" Congress in our national history. Both are perhaps exaggerations. In the health field, the average accomplishment is about 35 per cent of an ideal record.

We listed in the *Journal* for last January, eleven major bills (or groups of parallel bills) bearing on health problems which had been introduced. Of these, three have been passed in satisfactory form; and represent important advances in public health. They are the National Heart Act (Public Law 655), the Dental Research Act (Public Law 755), and the Stream Pollution Bill (Public Law 845). We urge public health workers to obtain copies of these three laws and to consider their possibilities.

A fourth measure, involving adhesion of the United States to the World Health Organization (Public Law 643) was passed with serious, but not fatal, amendments which have been discussed in a preceding editorial.

The other seven measures, dealing with cancer research, maternal and school health, training of public health personnel, the creation of a Federal Department of Health, Education and Security, and with the problems of housing and of medical care, were all smothered in committee. Almost all of them would have readily passed if they had come to the floor. It is important to recognize that the major procedure by which interested minorities strangle useful social legislation is through failure to hold hearings or failure to report a bill or refusal of

the rule necessary for consideration of a bill. Through the manipulation of committee machinery, a handful of influential politicians can block the realization of legislation which is desired by the majority of Congress, as has been the case in both the 79th and the 80th Congresses, with regard to housing. Our membership in the World Health Organization was salvaged, only at the last moment by great pressure upon the Rules Committee of the House of Representatives. This is a point important to bear in mind in working for sound health legislation in future sessions.

NINTH INTERNATIONAL CONGRESS ON INDUSTRIAL MEDICINE

IT is a decade since the last International Congress on Occupational Accidents and Disease took place—a decade in which industry, working conditions, and industrial health have undergone tremendous changes. It was therefore timely that the "Ninth International Congress on Industrial Medicine" should be called at London in September. This was originally described as an "International Congress on Occupational Accidents and Disease." The change in title significantly reflects a change in viewpoints which the past ten years have wrought in men's minds in this important segment of public health.

This year the program, instead of discussing accidents and disease as in former Congresses, had as its nucleus the factory and its environment, and then proceeded to the diseases of occupations, the organization of medical and nursing services, the training of medical and nursing personnel, legal aspects of industrial medicine, the social programs involved, and finally the integration of industrial medicine and community health services. It is significant but not surprising to note that a whole session was devoted to problems in the field of radiant energy.

The Congress should do much to clarify world thinking in its field. Its conclusions will be awaited with the keenest interest.

Clearing House on Public Health Salary Information

SALARIES IN LOCAL HEALTH DEPARTMENTS

The State Personnel Administration Unit of the U. S. Public Health Service has completed its analysis of a sample study of salaries of professional workers in 236 local health departments in 37 states. This number of questionnaires was returned, of 366 sent to all full-time local health jurisdictions serving populations of from 50,000 to 250,000.

Salaries currently paid were reported for the following groups of workers, together with the number and the median salary of each:

	Number Reporting			
	States	*Health Departments*	*Number of Workers*	*Range of Median Annual Salary*
Health officer	34	191	191	$6,480–$6,720
Sanitary engineer	25	90	114	3,840– 4,080
Sanitarian	36	212	956	2,640– 2,760
Professional laboratory worker	23	84	179	2,640– 2,880
Supervising public health nurse	36	159	239	3,000– 3,120
Staff public health nurse	37	224	1,648	2,400– 2,510
Public health educator	16	36	39	2,880– 3,120

Six health officers received $9,600 or more annually, but 7 received less than $4,800. No sanitary engineer received as much as $6,000 and 15 received less than $3,000.

Only three sanitarians received $4,800 or more and 245, more than one-fourth of the total, received less than $2,400. Two professional laboratory workers received $6,000 or more but 48, or more than one-fourth, less than $2,400.

Ten supervising nurses received $4,200 or more but 10 received less than $2,400, 17 staff nurses received $3,600 or more but 655, more than one-third of the total, received less than $2,400.

Of the 39 health educators, 10 received $3,600 or more and 5, less than $2,400. These salaries include any cost of living bonuses or other temporary adjustments.

With some notable exceptions it is true that the higher salaries were found in the higher income and higher cost of living states. But the salaries as reported are eloquent testimony as to reasons for the high turnover; the overall shortage, and the defection from the ranks, of public health workers. If a fourth of the sanitary engineers and the professional laboratory personnel of local health departments serving populations of from 50,000 to 250,000 are receiving less than a capable stenographer can demand it is little wonder that there are not enough recruits.

This study is a part of the plan of the A.P.H.A. Committee on Professional Education and the Association of State and Territorial Health Officers to make available to administrative and appropriating bodies current information on public health salaries. The report of the initial study, based on salaries in state health departments, was made in the *Journal* of May, 1948, p. 715. A second analysis of salaries in

state health departments is now in process.

General guidance of the studies is provided by a Subcommittee on Salaries, whose chairman is William R. Willard, M.D., Assistant Professor of Public Health, Yale School of Public Health. The analysis and tabulation of returns are done by the Administrative Analysis Unit of the U. S. Public Health Service under the direction of its chief, Don F. Simpson.

This study, published in limited quantity, is not available for general distribution but administrators or personnel officers with a need for it may secure it by request from the Committee on Professional Education, A.P.H.A., 1790 Broadway, New York 19, N. Y.

MASSACHUSETTS STANDARDIZES SALARIES

In 1947 Governor Bradford of Massachusetts appointed an advisory salary standardization board. The report of this board was published early in 1948 and is now available in printed form. Further, its recommendations were adopted by the General Court of Massachusetts.

Among the first results of the board's study and report is a standardization of the salary structure. Whereas previously there were more than 300 grades of positions in the state service, these have been consolidated into 74 grades for all except labor service, each with a salary scale, schedule of annual increments, and a maximum that takes effect beginning with the twelfth year of service. Minimum salaries for the 74 grades range from $1,200 to $9,900, maximum from $1,800 to $11,400. It might be added that only two current titles are in the lowest salary grade—union messenger and guide to the blind.

The immediate urgency of the cost of living was recognized by the board and the General Court which carried out its recommendations in a cost of living payment of $100 to every state employee on April 1, 1948. Permanent salary increases became effective July 1, 1948, for every state employee not on statutory salary. In no case was the increase less than the lowest annual increment of $120. The cost of the temporary cost of living adjustment was $2,200,000, the annual cost of the permanent salary increases $3,800,000, the maximum amount, the board said, "which it is possible to provide at the present time without calling for new or additional taxes."

Below are shown public health titles in the various salary grades and salary scales and increments for each of these grades:

14. Dental Hygienist, Junior Sanitary Engineer Aid
22. Assistant Biometrician, Inspector of Eggs, Public Health Nutrition Worker, Tuberculosis Field Nurse
24. Inspector Mastitis Control, Milk Records, Dairy Products; Milk Control Inspector, Investigator; Junior Bacteriologist, Chemist, Senior Sanitary Engineering Aid
28. Food Inspector
29. Health District Sanitary Officer, Milk Control Enforcement Officer; Public Health Dental Hygiene, Public Health Nursing, and Public Health Social Work Supervisor; Supervising Tuberculosis Field Nurse; Poultry Inspector
30. Public Health Nutrition Supervisor
31. Veterinary Food Inspector
32. Assistant Bacteriologist, Chemist; Junior Sanitary Engineer, Public Health Education Worker
35. Assistant Epidemiologist, Biometrician, Milk Control Hearings Officer, Supervising Health District Sanitary Officer, Supervising Instructor Public Health Nurse
37. Assistant Public Health Physician, Supervising Poultry and Egg Inspector
45. Assistant Industrial Sanitary Engineer; Assistant Sanitary Engineer; Senior Bacteriologist, Chemist

47. Associate Public Health Physician
48. Assistant Director Milk Control, Assistant District Health Officer, Chief Supervisor Public Health Nursing, Chief Veterinary Health Officer, Public Health Dental Supervisor, Teacher Training Coördinator Public Health Education
50. Epidemiologist
51. Associate Sanitary Biologist, Chief Coordinator Public Health Education, Chief of Laboratory, Senior Sanitary Engineer, Public Health Personnel Training Supervisor
52. Tuberculosis Clinic Physician
54. Chief Public Health Dental Supervisor, Public Health Physician
56. Director Food and Drug Supervision
58. Associate Sanitary Engineer
59. Assistant Director Biologic Laboratories, Cancer and other Chronic Diseases, Communicable Diseases, Local Health Administration, Maternal and Child Health, Public Health Administration, Venereal Diseases; Director Dental Health, Public Medical Care, District Health Officer; Supervisor, Crippled Children's, Tuberculosis Clinics; Supervisor Hospital Inspection
61. Sanitary Engineer
63. Director Biologic Laboratories, Cancer and other Chronic Diseases, Communicable Diseases, Local Health Administration, Maternal and Child Health, Venereal Diseases
67. Deputy Commissioner and Director Sanatoria and Tuberculosis

Salary Grade	*Annual Increment*	*Rates*					
		Minimum	*Second Year*	*Third Year*	*4th through 7th Year*	*8th through 11th Year*	*Maximum from 12th Year*
14	$120	$1,980	$2,100	$2,220	$2,340	$2,460	$2,580
22	120	2,460	2,580	2,700	2,820	2,940	3,060
24	120	2,580	2,700	2,820	2,940	3,060	3,180
28	120	2,820	2,940	3,060	3,180	3,300	3,420
29	120	2,880	3,000	3,120	3,240	3,360	3,480
30	120	2,940	3,060	3,180	3,300	3,420	3,540
31	180	3,000	3,180	3,360	3,540	3,720	3,900
32	180	3,120	3,300	3,480	3,660	3,840	4,020
35	180	3,240	3,420	3,600	3,780	3,960	4,140
37	180	3,360	3,540	3,720	3,900	4,080	4,260
45	180	3,840	4,020	4,200	4,380	4,560	4,740
46	180	3,900	4,080	4,260	4,440	4,620	4,800
47	180	3,960	4,140	4,320	4,500	4,680	4,860
48	180	4,020	4,200	4,380	4,560	4,740	4,920
50	240	4,200	4,440	4,680	4,920	5,160	5,400
51	240	4,320	4,560	4,800	5,040	5,280	5,520
52	240	4,440	4,680	4,920	5,160	5,400	5,640
54	240	4,680	4,920	5,160	5,400	5,640	5,880
56	240	4,920	5,160	5,400	5,640	5,880	6,120
58	300	5,100	5,400	5,700	6,000	6,300	6,600
59	300	5,400	5,700	6,000	6,300	6,600	6,900
61	300	6,000	6,300	6,600	6,900	7,200	7,500
63	300	6,600	6,900	7,200	7,500	7,800	8,100
67	300	7,800	8,100	8,400	8,700	9,000	9,300

Credit Lines

PUBLIC HEALTH WORKERS AND REHABILITATION

"Since Pearl Harbor, five American civilians have become disabled for every American soldier. At least 1,500,000 men and women in the civilian population have some disability which constitutes a barrier to their fullest mental, physical, social, vocational, and economic usefulness. And their number increases by 200,000 a year, through accidents and illness or from congenital causes." This paragraph is part of the foreword of a brief, concise and clear booklet on Vocational Rehabilitation which should be useful to all health workers (*Vocational Rehabilitation for Civilians*, Office of Vocational Rehabilitation, Federal Security Agency, Washington 25, D. C. 21 pp.).

Workers in health agencies become increasingly aware of the importance of well coördinated rehabilitation activities on the community level and of the part they must play in such planning. The booklet mentioned above lists as eight steps in vocational rehabilitation: case finding, medical and vocational diagnosis, guidance and counseling, physical restoration, training for a job, auxiliary services, placement, and follow-up. Case finding—the first step—depends on various sources. According to a statistical analysis on the sources of almost 150,000 referrals to state rehabilitation agencies, health agencies ranked as the largest single source (13.6 per cent), with insurance agencies, employment services, and selective service as close seconds.

Vocational rehabilitation activities are directed toward restoring the handicapped to employment at the highest possible level. This includes the spastic, the blind, the deaf, cardiac patients, amputees, the paraplegic, the mentally deficient, and many others, at home or in institutions. It includes those who have never worked and others who have to relearn their usefulness. "Employ the Physically Handicapped Week" (October 3–9) reminds the general public that this is a community problem. Employment of handicapped workers does not represent charity since it has been shown that the physically or mentally handicapped have been able to perform efficiently 3,500 different jobs and, in general, the handicapped have a better volume of production, higher attendance rates, better safety records and stability than non-handicapped workers.

HOW IT'S DONE IN OREGON

The July 14 weekly *Oregon State Board of Health Bulletin* tells how the 25th county and 19th full-time county or multi-county health unit was organized. Securing such a unit has long been an objective of the Malheur County Tuberculosis and Health Association, it reports. The County Medical Society not only approved but appointed a county health council with a prime objective of obtaining a health department. The Oregon Tuberculosis and Health Association financed a full-time staff member for 4 months to acquaint citizens with the need, purposes, and functions of a county health department. The part-time county health officer and the county nurse approved.

Result: the citizens voted a bond issue to support a health department, the county court approved a budget of $24,000 for the first year, sufficient to employ a full-time medical director, two nurses, a sanitarian, and a clerk.

Malheur County, with an area of nearly 4,000 square miles, in 1940 had a population of about 20,000. *Local Health Units for the Nation,* the report of the Subcommittee on Local Health Units, recommended a 3 county unit for this area including Grant and Harney Counties. This would make a unit of more than 10,000 square miles in area and less than 35,000 in population (1940) and illustrates graphically some of the problems of sparsely settled areas.

THE VERSATILE GOOBER

While Fairfield Osborn and William Vogt have been sounding their alarms about world-wide destruction of soil and dwindling food supplies, the British Government has developed a unique food program in Tanganyika, East Africa. The story is available in a very attractive pamphlet—*Not Just Peanuts*—available from British Information Services, 30 Rockefeller Plaza, New York 20. It is the story of a series of vast mechanized peanut farms planned for East Africa, to harvest three-quarters of a million tons of peanuts yearly and thus add to the world's edible fat and oil supply, to say nothing of raising the living standards of East Africa. This is one more evidence of the high level planning Britain initiated during the recent war in the effort to give all its citizens adequate nutrition. When the peanut project is in full swing every person in Britain will get 35 per cent more fat than the present ration of 8 ounces weekly.

ORIENTING DENTAL STUDENTS IN PUBLIC HEALTH

In order to aid the dental student "to appreciate the scientific and technical problems with respect to public health theory and practice and their various relationships to dental care," Alfred J. Asgis, D.D.S., Assistant Professor of Oral Surgery and Lecturer in Public Health, New York University College of Dentistry, has prepared *Public Health and Dental Care.* He describes it as a "work book for the classroom." It is a tool to introduce the dental student to the background of the public health movement, essentials of public health dentistry, dental economics, training, and dental health planning.

Suggested topics and questions for exploration and discussion and a list of references together with blank pages accompany each paper. This should be a valuable aid both to the teacher and to the student in giving direction to the latter's interest and activity. Its design should help to interest the oncoming dentist in the public health aspects of his profession. Available from New York University College of Dentistry, 209 E. 23rd Street, New York. $2.00.

THE STORY OF BRITISH CHILDREN DURING THE WAR

"The Health of the School Child" is the title of the 1939–1945 war period report of the Chief Medical Officer of the British Ministry of Education, Sir Wilson Jameson.

It is the story of the evacuation of three-quarters of a million children, of the annual medical examination of more than a million and a quarter children of school age, of improved health and nutritional standards during the war, of lowered infant and child mortality rates.

The reasons are many but chiefly the "brilliantly successful food policy," described as "the first large-scale application of the science of nutrition to the population by rationing according to needs, by subsidies on staple foodstuffs, by home production and importation of suitable foods in suitable amounts, and by Lend-Lease arrangements. All these except Lend-Lease have been taken over into Britain's postwar national organization.

This is an exciting story of how, with an expenditure of $20,000,000, Britain's children were involved in "a victory more lasting than the greatest military triumph . . . the victory has been consolidated and has created a base for further advance."

Available from the Sales Department, British Information Services, 30 Rockefeller Plaza, New York 20, 90 cents.

MORE STIRRINGS IN INDIANA

The first annual report of the Health Section of the Indianapolis Council of Social Agencies (901 Lemcke Building, Indianapolis 4) has recently been published—modest as becomes youth—signalizing the first year of full-time staff service. Its story is one of solid accomplishment nevertheless. In May also it issued Volume 1 Number 1 of a one page monthly *Health Bulletin*. The report of the Priority Committee makes the development of a master health plan for metropolitan Indianapolis a major goal, the foundation of which is full-time public health department service in both city and county.

CONSOLIDATION HITS ITS STRIDE

Ohio Public Health, of the Ohio Tuberculosis and Health Association, is authority for the news that the Metropolitan Health Council of the City of Columbus and Franklin County has made one of its major projects a proposal to merge the five health departments in the county—Columbus and Franklin County with full-time health officers, the towns of Bexley, Grandview, and Upper Arlington—into a single county health department. This recommendation was first made a year ago by the Rural Health Committee of the Council after a survey of health services in the rural areas of the county.

The proposal for merging city and county health services has been endorsed by the Columbus Mayor, Academy of Medicine, Farm Bureau, and Community Health Services, as well as the Metropolitan Health Council. The last has created a Health Department Integration Committee which includes membership, both official and voluntary, from the smaller communities in the county.

The population of Franklin County is about 400,000 of which all but one-fifth is in Columbus. Thus the four administrative units outside of Columbus have been serving a total population of less than 85,000. Per capita health expenditures have ranged from $1 in Columbus to 15 cents in two of the suburbs.

INDUSTRY AND SANITATION

Another example of the growing recognition by industry of the money value of good sanitation is given in the *Sanitation News* bulletins published by the National Confectioners' Association, 1 N. LaSalle St., Chicago 2. Directed to the confectionery industry, these have been published at intervals of about 6 weeks and cover such topics as product control, storage, insect growth and control, rodents and their control, and personal hygiene.

EACH HAS ITS JOB IN DENTAL HEALTH

The Georgia Department of Public Health, Atlanta, has put out an attractive pamphlet in color, *For Dental Health*. In pictures and a few words it tells what the responsibility of the individual, the parent, teacher, dentist, public health worker, and citizen is in promoting dental health. Pictures of attractive youngsters are its passport to attention.

WORTH ACQUIRING

War in the Kitchen was prepared in the New York State Department of Mental Hygiene (State Office Building, Albany, N. Y.) by someone with a sense of humor and an appreciation of "brevity as the soul of wit." Calling

the kitchen a fortress against a deadly enemy—germs—in brief compass and bright language it tells food service employees of New York State mental institutions how not to contaminate food, how to wash it, what foods need thorough cooking, how to wash dishes, etc. The booklet does not say so, but perhaps a pretty please will get it for you. It ought to be a right smart help in food handlers' courses.

This Will Kill You will interest you because (1) it illustrates how words, pictures, color, and style generally can deliver their message so that he who runs may read, even without a Phi Beta Kappa key, (2) it gives the simple arguments in favor of a national health insurance plan. Illustrations by Eric Godal. Committee for the Nation's Health, 1790 Broadway, New York 19. $.03–$.0375 per copy depending on size of order.

You Can Make a Good Radiograph: Here's How, prepared by Arnold J. Moen, X-Ray Engineer of the Washington State Department of Health's Tuberculosis Division, (1412 Smith Tower, Seattle 4) is subtitled, Practical Darkroom Procedure for X-Ray Film. Detailed instructions then follow on mixing solutions, temperature control, order of processing, exposure technique and all the necessary details for good results. The longest section is "The Reasons Why" and the payoff is, "These directions may sound like a lot of bother but experience has proved that when such a standard routine procedure has been established in the darkroom, the radiographic results are more consistent."

BOOKS AND REPORTS

All reviews are prepared on invitation. Unsolicited reviews cannot be accepted. All books reviewed in these columns may be purchased through the Book Service.

A History of Medicine — *By Douglas Guthrie. Philadelphia: Lippincott,* 1946. 448 pp. Price, $6.00.

This is a reprinting of an excellent *British History of Medicine,* with an introduction by S. C. Harvey of Yale. It is unusually well written and can be read, as well as used, for reference. The information seems to be well documented, and the 72 plates are illuminating and most of them from sources not otherwise readily accessible. The discussions of prehistoric medicine and of the ancient medicine of India were of particular interest to the reviewer. The chapter on "The Rise of Specialism and of Preventive Medicine" brings together in convenient form much valuable information on the specialties. Preventive medicine, however, is dismissed in six pages in this chapter and the Appendix lists only five references on public health, of which but one is of primary importance.

This is perhaps the best brief work on general medical history which we have—perhaps the best which could be prepared. It will be of value for reference and may be read by the medical student to advantage. It is obviously impossible, however, in one volume of some 400 pages to develop the historical perspective and the philosophical interpretation necessary for an understanding of the real significance of the history of scientific advance in this field. One may fairly raise the question whether the history of medicine is not too vast and complex a subject to be profitably treated in one small volume. Castiglione takes over 1,000 pages for the job. The history which Sigerist is preparing will—we understand—include at least eight volumes; and there is only one Sigerist. What we most need, perhaps in the future, is the thorough and thoughtful exploration of particular periods of medical history or of particular problems of medical science on a scale that permits a real critical illumination of the topic involved.

C.-E. A. WINSLOW

Physiologic Therapy in Respiratory Diseases—*By Alvan L. Barach, M.D. (2nd ed.). Philadelphia: Lippincott,* 1948. 408 pp. 74 illus. Price, $9.00.

This book is a discussion of the use of oxygen, carbon dioxide, and helium in the treatment of pulmonary disorders. It should interest scientists particularly concerned with the processes of respiration, anesthetists who use nitrous oxide, and clinicians who specialize in pulmonary disease.

The first 3 chapters cover the historical development of these modalities. Then there are 20 chapters each devoted to the treatment of a chest condition (among them pneumonia, asthma, emphysema, bronchiectasis, pulmonary embolism and infarction, post-operative atelectasis, congestive heart failure, asphyxia, nitrous oxide anesthesia, pulmonary tuberculosis, hiccough, and coronary thrombosis), and finally 5 chapters concerning apparatus and methods.

Much of the discussion of anoxia is quite theoretical and some of it seems repetitious at times, but it is not obscure. Chemotherapeutic aerosols are considered in relation to pneumonia, asthma,

bronchiectasis, and sinusitis. The chapters on apparatus are well illustrated, they enumerate the advantages and disadvantages of oxygen tents and rooms, oxygen masks, and nasal and pharyngeal catheters, and give specific advice concerning their use in different conditions.

There is a general index and at the end of each chapter there is a rather long bibliography.

The book is obviously the work of a man who understands the physiology of respiration in health and disease and who has had wide experience in this field. The clinician will find it easy to use as a reference book and should find it valuable in this capacity.

ALAN L. HART

Principles of Occupational Therapy—*Edited by Helen S. Willard and Clare S. Spackman. Philadelphia: Lippincott,* 1947. 416 pp. Price, $4.50.

Nineteen authors collaborated with the editors to produce this excellent collection of monographs to serve as a basic text for doctors, nurses, social workers, and occupational therapists.

The history, scope, and aims of occupational therapy and the organization of occupational therapy departments are discussed. The principles of occupational therapy are applied to a multitude of general problems within hospitals. Special chapters are devoted to mental disease, cerebral palsy, arthritis, tuberculosis, and visual handicaps. Finally, Army and Navy occupational therapy departments and the Veterans Administration rehabilitation program are described.

Until 1941 there were only 5 schools for professional occupational therapy training: today there are 26. The great increase in registrations, approximately from 100 to 1,750, has necessitated some control of the number of new schools.

This is not a textbook to describe, in detail, technical methods employed by occupational therapists. Its purpose is to set forth the principles underlying occupational therapy — an objective which is admirably achieved. The general plan of presentation is: (1) description of chief characteristics of each disability; (2) discussion of general principles of occupational therapy in relation to these characteristics; and (3) enumeration of definite occupational therapy procedures which can be used in specific instances. This presentation of the basic principles and objectives should be valuable not only to occupational therapists but to other professional workers who can use it to understand and utilize occupational therapy and appreciate its value to the disabled.

As is frequently true when authors separately contribute to a symposium, duplication occurs. Examples are the several descriptions of desirable personal attributes for occupational therapists, and the many recommendations for workshops for the disabled. The reader who needs a composite of such opinions will find the index helpful but, frequently, not sufficiently extensive.

NORVIN C. KIEFER

Basic Facts of Health Education, Selected Articles from the Ministry of Health Bulletins published in the Pharmaceutical Journal, 1944–1947. *London: The Pharmaceutical Press,* 1948. 193 pp. Price, 7 s. 6d.

This publication is an interesting assortment of brief health articles by officers of the British Ministry of Health and allied health authorities published at quarterly intervals over a three year period in the *Pharmaceutical Journal.*

The articles were designed primarily to help pharmacists keep abreast with developments about which they might be consulted by the general public. The wide range of subject matter covered reflects well the important educational role of pharmacists with individuals in their "across the counter" contacts.

This volume will be of general inter-

est to members of the medical, pharmaceutical, nursing, and public health professions. A. HELEN MARTIKAINEN

Principles of Medical Statistics—*By A. Bradford Hill, D.Sc., Ph.D. (4th ed.) London: The Lancet Ltd.,* 1948. xii and 252 pp. Price, 10s. 6d.

It is always interesting to follow the development of a successful textbook in its course through successive editions: to deduce something of the author's development as life and experience impinge on him. The present edition of Hill's book is a thorough revision and expansion of the third (it has 61 more pages) and so incorporates much of the author's thinking in the past years.

The core of the book is unaltered. The presentation is still designed to give the student a clear idea of the simple, essential tools necessary for the statistical attack on quantitative data in medicine and public health. The careful reader will learn to use these tools; what is more important, he will know why he is using a particular one, and its limitations. He should also find it more difficult to draw wrong conclusions from apparently correct procedures—probably the most frequent and damaging fault of statistical analysis.

The bulk of the new material is devoted to the expansion and clarification of points which have proved to be troublesome. A whole new chapter is devoted to "The Average," and a second chapter on "Standardized Indices" has been added. Considerable additions have been made to the discussions of distributions, the characteristics of rates, and the use of "significance" tests. The inclusion of an occasional word or phrase gives evidence of heated arguments which must have taken place in classes, or outside. HUGO MUENCH

Oral Vaccines and Immunization by Other Than Usual Routes—*By David Thompson and Robert Thompson, assisted by James Todd Morrison. (Published for the Pickett-Thompson Research Laboratories, London, England.) Edinburgh: E. S. Livingstone, Ltd.,* 1948. xi and 329 pp.

This book is a reference work for the research worker interested in immunization by other than parenteral routes, and for this group it should prove of great value. It is divided into four parts, three of which deal with oral immunization, and these sections make up the greater portion, while Part IV is concerned with immunization by other unusual routes, including the respiratory tract, and immunization through the skin by means of ointment vaccines. As stated in the preface, the authors attempt to bring together into one volume the results of many researches on the subject, and although not all of the literature is covered, a large portion is summarized here—a spot check of references on a few diseases discloses this to be so. The bibliography is alphabetical, and the references are unnumbered with relation to the text, making it less handy to use.

The authors feel that immunity can be obtained using vaccines administered by unorthodox routes. It is safe to say that with certain vaccines this is possible, but practical considerations such as size and number of doses is pertinent, and in general the authors' opinion of efficacy is optimistic, measured against what is known today concerning inoculation against the same diseases by the more orthodox routes.

FRANKLIN H. TOP

Tuberculosis Nursing Manual—*By Martha E. Flynn and Doris Roberts, under the direction of Dr. LeRoy R. Allen. Baltimore: Maryland State Department of Health,* 1948. 40 pp.

The revised tuberculosis section of the *Public Health Nursing Manual* of the Maryland State Department of Health provides the public health nurse

with pertinent information regarding the disease tuberculosis and summarizes the responsibilities of the public health nurse in the tuberculosis nursing service.

In the introduction the authors point out that "the follow-up standards of visits to cases and contacts are minimum and will have to be modified upward at the advice of the physician or at the discretion of the public health nurse." This is important to remember when reading the manual, as some physicians may desire closer supervision and others may feel less supervision is necessary for their tuberculosis patients and contacts. The authors have included summaries of the minimum follow-up standards for tuberculous patients and the minimum follow-up standards for contacts, which is of value as a quick reference. A definition of who is a contact could be included to clarify further the follow-up of contacts.

They point out that the frequency of nursing visits to the home must be decided on an individual family basis and factors influencing this decision are presented. The selection of the public health nurse's tuberculosis case load and the clinic case load is clarified so that supervision is advised for those who need it and not continued indefinitely to families when contact with the source case has been broken over two years.

This manual is carefully prepared with a detailed index and reference. Any nurse who is interested in tuberculosis control will find this book stimulating and valuable, and it is highly recommended for those who are compiling or revising a tuberculosis nursing manual. HELEN M. GREEN

The Care of the Teeth, Prenatal and in Infancy—*By C. Herbert H. Russell, M.B., Ch.B., L.D.S., Altringham, Eng.: John Sherrat & Son,* 1948, 48 pp. Price, 2/ net.

The author of this handbook for mothers and expectant mothers presumes that it is not "a matter of chance whether teeth, when erupted, were of good or poor quality, and whether they were arranged evenly or too crowded.... Now we know that to a great extent these things can be controlled." Most dental authorities in the United States would not support this premise. As Higley points out, "all the etiologic factors are not known, many are not or cannot be detected until a deformity appears, some are practically unavoidable because inherited. . . . Incipient deformity does and probably always will occur regardless of the dentist's desire to practice prevention." However, our American authority adds "Serious deformity can be minimized if the dentist recognizes incipient deformity."

The concept of dental caries etiology, as expressed in this volume, is likewise not in agreement with the consensus in this country. Most American authorities would contradict the statement that, "difference between good hard teeth and soft chalky teeth is largely dependent upon prenatal care."

This volume clearly indicates the urgent need for research in dental fields. The recent passage by Congress of an appropriation for dental research should therefore be acclaimed by public health personnel. J. M. WISAN

Ordinance No. 2467 — Providing for the Regulation and Operation of "Care Homes"—*City of Fort Worth, Texas: Public Health and Welfare,* 1947.

This is an extraordinary ordinance. Those who plan to have such an ordinance drawn or amended can profit from its study. This ordinance has good and bad features. The companion "Rules and Regulations" apparently are separately adopted.

Even "Boarding Homes" for persons 60 years or more of age are required to secure permits. The Director of Public Health and Welfare is authorized,

among other things, (1) to determine type as well as the number of patients to be cared for in a given home; (2) to cause the operator, including each member of an association or corporation, to furnish satisfactory evidence of financial responsibility (desirable but probably too extreme and unenforceable); and, (3) to require that the operator file floor plan detailing beds, exits, etc.

Some desirable and unusual requirements set forth in the "Rules and Regulations" include: an isolation room with separate toilet and lavatory for terminal cases; a suitable room for the proper care of the dead pending removal; a properly equipped recreation room; a room where patient may (upon request) talk privately with relatives, clergymen, etc.

A building of wood frame construction, having inside walls and ceilings covered with plaster (on wire lath) or gypsum board, and without enclosed stairwells and boiler room, and, whenever indicated, sprinkler and signal systems, would be disapproved for such use by fire authorities in the New York City Area.

The major shortcomings of the ordinance and its rules appear to be, (1) no provision is made for probationary licensure; (2) publicly operated "Care Homes" are exempted; (3) placement of patients in basement rooms may be permitted; (4) the requirements regarding extent and quality of medical care and supervision of patients in such facilities (although sounder than those in most such ordinances) fall short of those possible, under a hospital affiliation plan (rehabilitation and occupational therapy are not mentioned).

One could question the advisability of admitting alcoholics, providing for appeal of the operator to City Council, requiring health certificates for food handlers, relating number of sanitary installations on all floors to number rather than to extent of ambulation of patients, stating only a minimal width of beds, prescribing minimal quantity of bedding, linens, etc., in terms of pieces per patient, giving all operators opportunity to qualify for "Life Fee" and having permits expire 1 year after date of issue.

This ordinance has been in effect 8 months. Administrative problems involved in its enforcement should be recounted at an early date.

JOSEPH H. KINNAMAN

Essentials of Nursing—*By Helen Young, R.N., Eleanor Lee, A.B., R.N., and Associates. (2nd. ed.) New York: Putnam's,* 1948. 556 pp. Price, $3.75.

This second completely revised edition of one of the important basic texts for students offers up-to-the-minute information on essential nursing procedures. It is well illustrated and with its tables of weights, measurements, abbreviations, and normal values in common diagnostic tests should serve as an indispensable reference book in the offices of public health nursing agencies. It is a pleasure to recommend it unreservedly for that purpose. Anyone wishing more detailed information will find the copious reading lists at the end of each chapter helpful.

DOROTHY DEMING

You Can Lick TB—*Handbook for Tuberculosis Patients, Pamphlet 10–18. Washington, D. C.: Veterans' Administration,* 1947. 36 pp.

This 36 page handbook for tuberculosis patients, designed for G. I.'s, contains suggestions which civilian tuberculosis hospitals might pursue with profit. It presents in extremely simple, nontechnical, sometimes slangy English basic non-controversial facts about tuberculosis, always keeping the patient as a human being and his probable mental attitude in mind.

The patient is warned against false advice and misinformation by others; also against his own failure to follow his

physician's advice. He is reminded of the concern of large numbers of people for his recovery, and of various governmental services, including rehabilitation, available.

The booklet has a cheerful look. Hope of permanent recovery is stressed. Multicolored charts for recording hourly schedules advised by the physician then observed by the patient are included.

JOHN H. KORNS

Occupational Medicine and Industrial Hygiene—*By Rutherford T. Johnstone, M.D.; St. Louis: Mosby,* 1948, 604 pp. 117 illus. Price, $10.00.

The largest portion of this well balanced volume is devoted to the clinical aspects of industrial poisonings and diseases. The subject matter is grouped according to the chemical and physical nature of the materials to which the worker is exposed, for example, solvents, metals and dusts. There are, in addition, excellent discussions of the subject of workmen's compensation, the teaching of industrial medicine, functions of the industrial physician, preëmployment examinations and the placement program. Industrial hygiene receives lesser emphasis but certainly is sufficiently detailed for the general information of the plant physician.

In all, there are not many textbooks in the field of the occupational diseases and in the past these have, for the most part, been devoted to elaborate descriptions of industrial processes and the substances employed in industry which produce disease. Detailed clinical knowledge of the occupational diseases has been accumulating rapidly during the past twenty years. The real contribution of the present volume is the assembling of such detailed clinical information which is made available to the medical profession in one place.

Two additional portions of the book require mention and commendation. One is a list of chemicals which are present in common "trade name" products. The second is an outline of methods for the sampling and analysis of atmospheric contaminants, prepared by Senior Chemist, F. H. Goldman of the National Institute of Health.

Many photographic reproductions are presented, some of which are in color. These serve admirably to present some of the bone marrow, blood, and other pathological findings so well described in the text.

It is the opinion of the reviewer that the present volume supplies an important need in the field of the occupational diseases and industrial medicine. The practising physician, as well as the specialist in this field, should find the book of essential importance.

LEONARD GREENBURG

Taking the Cure—*By Robert G. Lovell, M.D., New York: Macmillan,* 1948. 93 pp. Price, $2.00.

As a former patient the author of this book has gone through that difficult period of adjustment that every new patient encounters when he enters a hospital for the first time. He has attempted to present to the new patient an explanation and answer to the most perplexing problems that arise in his new environment. At times the phraseology is a bit advanced for many patients in our hospitals and it would have been improved with more illustrations.

In paragraphs listed in the index in the first half of the book, the chief topics of interest to the new patient are discussed briefly. In the latter half of the book the author has delved more deeply into the peculiarities of the disease and here one might wish to find even more complete explanations than are given. So important a part of our program as rehabilitation, for example, is given scant space and such references as occur are barely suggestive of its real possibilities. The patient is to believe that there is a better life ahead but

he is shown few real guides to achieve it once his hospital phase is completed. Also, it would have been valuable had the author discussed the facilities for supervision and care outside the hospital. Nothing is said about the family doctor, the health department, the visiting nurse, and other agencies that so frequently contribute in some manner to the well-being of the patient and his family. The appendix presents excellent suggestions on the art of reading, listening to music, and a few games.

This is a worth while book that will help many patients in the hospital to understand more clearly their personal responsibility in the cure of their disease.

HERBERT R. EDWARDS

Mental Health in Modern Society —*By Thomas A. C. Rennie, M.D., and Luther E. Woodward, Ph.D. New York: The Commonwealth Fund,* 1948. 410 pp. Price, $4.00.

This is really two books in one; a genuine bargain for those interested in both subjects treated. Parts I and II of the text deal with psychiatric lessons learned from the recent war. Part III, the latter half of the book, moves into what may be termed the public health phase of mental hygiene, and justifies the title *Mental Health in Modern Society.*

This title will attract the attention of an ever-widening circle of persons concerned, both for themselves and others, with developing and maintaining amidst the perplexities of the times this priceless thing called mental health. Although there is danger that some war-weary minds will be repelled by the opening chapters devoted to the psychiatric problems of war, yet the contents of Part III will more than repay earnest seekers after the more comprehensive desiderata promised by the title.

Public health mental hygiene, as stated in the preface, rests on the premise that "Whereas the clinician's concern is with illness, the public worker is concerned with positive help. His job is keeping people well. . . . His effort is directed primarily to finding and controlling foci of infection. By analogy, those who are concerned with mental health will have to deal with ignorance, superstition, unhealthy cultural patterns, and the rigidities and anxieties of parents, as well as with social conditions which foster the development of neuroses and maladjustment."

Chapters XII and XIII, devoted respectively to Family Living and Education, comprise one of the most adequate statements known to the reviewer of the basic concepts of preventive mental hygiene. These chapters alone are worth the price of the book. The remainder of Part III—dealing by chapters with the contributions of practising physicians, social workers, psychologists, pastoral counseling and church life, mental hygiene in industry, and interviewing and counseling—all support the central thesis that " mental health problems are to a large degree socially conditioned and that to promote mental health it is necessary to give attention to groups as well as to individuals."

This book, specifically for the special contents noted above, is strongly recommended for all public health workers.

PAUL H. STEVENSON

Noah Webster: Letters on Yellow Fever Addressed to Dr. William Currie—*Introductory essay by Benjamin Spector. (Supplements to the Bulletin of the History of Medicine No. 9.) Baltimore: The Johns Hopkins Press,* 1947. vi + 110 pp. Price, $2.00.

In the history of American civilization, the name of Noah Webster stands out preëminently as a lexicographer and schoolmaster. Like so many of his contemporaries, however, Webster had a wide variety of other interests, among

them various scientific subjects. His major contribution to science was in the field of epidemiology, culminating in the publication in December, 1799, of his *Brief History of Epidemic and Pestilential Diseases* (2 volumes). This work is noteworthy on two grounds: it offers an excellent summary of epidemiological thought at the close of the 18th century, including a history of epidemiological theory from ancient times to 1799; and it presents a clear exposition of the anticontagionist standpoint with particular reference to the influence of the epidemic constitution in the causation of pestilence.

Webster had arrived at this position after a decade of study. The basis for the *Brief History* had, however, already been published several years earlier. It appeared in 1797, in the October, November, and December issues of the New York *Commercial Advertiser* as a series of 25 letters addressed to Dr. William Currie of Philadelphia. When yellow fever appeared in Philadelphia in 1797, Dr. Currie had written a series of newspaper letters advocating the theory that the disease was propagated by contagion and had been imported. Webster denied the foreign origin of the disease and asserted that it arose from local causes.

These letters Dr. Benjamin Spector has reissued, together with an introductory essay in which he appraises Webster's contribution to American medical thought, and in particular evaluates the content of the letters in terms of epidemiological ideas prevalent at the time. Webster's letters will be of interest to all those who realize that epidemiology is still a science with many unsolved problems, and that in essence the riddles that Webster tried to solve are still with us. Dr. Spector is to be congratulated for having made these letters available to a wide audience.

GEORGE ROSEN

Laboratory Experiments in Physiology—*By William D. Zoethout, Ph.D., Professor Emeritus of Physiology in the Chicago College of Dental Surgery (Loyola University). (4th ed.) St. Louis: Mosby,* 1948. 263 pp. Price, $3.00.

This is the fourth edition of a standard and widely used manual covering laboratory experiments designed to give firsthand information on all the major functional aspects of biological systems, particularly as these relate to human physiology. The first two chapters deal with the properties of experimental equipment and the nature of relevant chemical and physical systems and their effects on body function. Experiments are arranged in the eleven chapters of the first part of the manual on the basis of the body system under consideration. The second part of the manual deals in six chapters with metabolism, nutrition, and related biochemistry. The textual treatment is brief and, like the physical aspects of the book itself, is of a high order. This modest volume deserves continued success.

DONALD YOUNG SOLANDT

BOOKS RECEIVED

Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed.

ADVANCES IN BIOLOGICAL AND MEDICAL PHYSICS. Vol. I. John H. Lawrence and Joseph G. Hamilton. New York: Academic Press, 1948. 484 pp. Price, $8.60.

ADVANCES IN PEDIATRICS. Vol. 3. S. Z. Levine, Allan M. Butler, L. Emmett Holt, Jr., A. Ashley Weech. New York: Interscience, 1948. 363 pp. Price, $7.50.

DAIRY MANUFACTURING PROCESSES. E. L. Fouts and T. R. Freeman. New York: Wiley, 1948. 237 pp. Price, $3.50.

EVERYDAY MIRACLE. Gustav Eckstein. New York: Harper & Brothers, 1948. 235 pp. Price, $2.75.

FELLOW AMERICANS. Vol. I. Orientation: The World We Live In. Syrus Bass. Chicago: Atomic Age Publishers, 1948. 504 pp. Price, $3.75.

MEDICAL WRITING. Morris Fishbein, M.D. (2nd ed.). Philadelphia: Blakiston, 1948. 292 pp. Price, $4.00.

MORE THAN ARMIES. The Story of Edward H. Cary, M.D. Booth Mooney. Dallas: Mathis, Van Nort, 1948. 270 pp. Price, $5.00.

NEW TECHNIQUES OF HAPPINESS. Albert Edward Wiggam, D.Sc., LL.D. New York: Wilfred Funk, 1948. 352 pp. Price, $3.75.

NURSING FOR THE POLIOMYELITIS PATIENT. Prepared and Published by the Joint Orthopedic Nursing Advisory Service of the National Organization for Public Health Nursing and the National League of Nursing Education. New York: N.O.P.H.N., 1948. 88 pp. Free.

PEDIATRIC NURSING. Gladys S. Benz, R.N., B.S., M.A. St. Louis: Mosby, 1948. 638 pp. Price, $4.00.

PIONEER HEALTH CENTRE—Peckham, London. London: National Trust for the Promotion and Study of Health. 16 pp. Price, 6d.

PLANNING FOR HEALTH IN POSTWAR HAWAII. Public Health Committee. Honolulu, Hawaii: Chamber of Commerce, 1948. 76 pp.

PRACTICAL BACTERIOLOGY, HEMATOLOGY, AND PARASITOLOGY. E. R. Stitt, M.D., Paul W. Clough, M.D., and Sara E. Branham, M.D. (10th ed.). Philadelphia: Blakiston, 1948. 989 pp. Price, $10.00.

PUBLIC HEALTH ENGINEERING. Vol. I. Earle B. Phelps. New York: Wiley, 1948. 655 pp. Price, $7.50.

RONALD ROSS, DISCOVERER AND CREATOR. R. L. Mégroz. New York: Macmillan, First Published in 1931. 282 pp. Price, $3.00.

SOCIAL DENMARK. A Survey of the Danish Social Legislation. Edited and Published by Socialt Tidsskrift Copenhagen, 1947. 475 pp.

SOCIAL GROUP WORK. Principles and Practices. Harleigh B. Trecker. New York: Woman's Press, 1948. 313 pp. Price, $3.50.

SURVEY OF FOOD AND NUTRITION RESEARCH IN THE U. S., 1947. Washington, D. C.: National Research Council, 1948. 306 pp. Price, $1.00.

SUCCESSFUL MARRIAGE: A MODERN GUIDE TO LOVE, SEX AND FAMILY LIFE. Edited by Morris Fishbein, M.D., and Ernest W. Burgess, Ph.D. New York: Doubleday, 1948. 547 pp. Price, $6.00.

YOUR DIET FOR LONGER LIFE. James A. Tobey, Dr.P.H. New York: Wilfred Funk, 1948. 280 pp. Price, $3.50.

ZINSSER'S TEXTBOOK OF BACTERIOLOGY. Revised by David T. Smith, M.D., Donald S. Martin, M.D., M.P.H., Norman F. Conant, Ph.D., Joseph W. Beard, M.D., Grant Taylor, M.D., Henry I. Kohn, Ph.D., M.D., and Mary A. Poston, M.A. (9th ed.). New York: Appleton-Century-Crofts, Inc., 1948. 992 pp. Price, $10.00.

THE FOLLOWING REPORTS HAVE BEEN RECEIVED

ARKANSAS STATE BOARD OF HEALTH. Division of Communicable Disease Control. Tenth Annual Report for the Year Ending December 31, 1946. A. M. Washburn, M.D., Director. Little Rock: State Board of Health, 1948. 23 pp.

ARKANSAS STATE BOARD OF HEALTH. Annual Report July 1, 1946 to June 30, 1947. Little Rock: State Board of Health, 1948. 66 pp.

Baruch Committee on Physical Medicine. Annual Report 1947. New York: Baruch Committee on Physical Medicine. 182 pp.

BETH ISRAEL HOSPITAL. Bi-Annual Report 1946–1947. Boston, Mass.: Beth Israel Hospital. 40 pp.

EVANSTON, ILLINOIS. DEPARTMENT OF HEALTH, 1947. Annual Report. Evanston, Ill.: Department of Health.

HOSPITAL FOR JOINT DISEASES. Annual Report for the Year 1947. New York: Madison Avenue and 123rd Street. 103 pp.

LINCOLN CITY-LANCASTER COUNTY, NEBRASKA

BOARD OF HEALTH. 1st Annual Report. July 1947–June 1948. Lincoln, Neb.: Department of Health City-County. 16 pp.

PENNSYLVANIA TUBERCULOSIS SOCIETY. Annual Report April, 1947, to March, 1948. Philadelphia: Pennsylvania Tuberculosis Society. 16 pp.

PUERTO RICO, Report on the Statistical System. Puerto Rico: Division of Statistics, Bureau of the Budget, 1948. 53 pp.

SAGINAW COUNTY DEPARTMENT OF HEALTH. Annual Report, 1947. Saginaw, Michigan: County Health Center. 58 pp.

SHELBY-EFFINGHAM BICOUNTY DEPARTMENT OF HEALTH. Annual Report for Fiscal Year Ending June 30, 1948. Shelbyville, Ill.: Health Center Building. 8 pp.

WORCESTER, MASS. DEPARTMENT OF PUBLIC HEALTH. Annual Report, 1947. Worcester: Harrigan Press. 81 pp.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Unfancy Writing — All right, infant hygiene isn't your job! Very well, you aren't a baby's parent! Read this paper anyway. (Time out for your skimming.) Have you ever seen a scientific treatise with less stuffy writing? Or one more readable? The reason the writer wished to remain anonymous is beyond my comprehension.

ANON. "Baby Independence": A Mother-Baby Situation. Pub. Health Nurs. 40, 7:359 (July), 1948.

Some Mild, Tepid Crowing—None of the large cities had a diphtheria mortality rate (for 1947) in excess of 5. Those cities with no deaths increased to 49. These are the best records since 1940, and the total of all diphtheria deaths in all the cities was lowest on record.

ANON. Diphtheria Mortality in Large Cities of the United States in 1947. J.A.M.A. 137, 17:1525 (Aug. 21), 1948.

Tuck This Away—Routine use of alum-precipitated diphtheria toxoid and pertussis vaccine mixture should give a higher degree of protection against diphtheria than the toxoid alone. This is just one finding of a nicely controlled study.

BELL, J. A. Diphtheria Immunization J.A.M.A. 137, 12:1009 (July 17), 1948.

Just Pure Fun — Please don't anybody miss this. It's Mary Ellen Chase at her best.

CHASE, M. E. The Country Doctor on the Maine Coast. New England J. Med. 239, 8:283 (Aug. 19), 1948.

What Do People Like to Read?—What they can read easily, says this student of writing. Perhaps this discussion of easy reading will prod you to buy Flesch's *The Art of Plain Talk* if the preceding paper by this writer—praised in the February bibliography—didn't quite send you to your book sellers. What about exposing your mind to that danger a second time?

COWING, A. G. Writing That Sells Good Diet. J. Am. Dietet. A. 24, 7:592 (July), 1948.

New Broom — How the $3,000,000 grants-in-aid for state mental hygiene programs are being put to work is a matter you should know about. In five short months, wonders have been accomplished, but the job ahead is as formidable as ever.

FELIX, R. H. The National Mental Health Program. Pub. Health Rep. 63, 26:837 (June 25), 1948.

Population vs. Subsistence—Do you occasionally feel the urge to look up from, and beyond the confines of, your particular job? Well, here are nine grim papers about modernizing undeveloped areas, that make stimulating—if not easy—reading. If nine are more than you find assimilable, then read the one about what WHO proposes to do about the health of these areas.

FORREST, W. P., *et al.* Health Aspects of International Approaches to Problems of Undeveloped Areas. Milbank Quart. 26, 3:280 (July), 1948.

Not for Nurses Only—These questions are raised: Is mental ill health a major public health problem? Can nurses give the same sort of help in this field that they do in their "regular" work? Can they do it without neglecting the rest and without psychiatric training? Are you interested in the answers? You'll get some of them here.

GUNDY, C. H. Mental Hygiene in the Child Health Program. Canad. Pub. Health J. 39, 7:255 (July), 1948.

Miscellany — Of all the scientific periodicals I read, the (British) *Health Education Journal* gives me the most pleasure. In this issue, for instance, the latest pronouncements on dental health are set forth by our A. D. A.'s Executive Secretary. In a postscript, the editor says blandly, this is what the Americans think, the authoritative British viewpoint differs. In the same number are a variety of papers on psychological problems of marriage, industrial hygiene, and medicine in the ancient world. Gebhard tells about the Cleveland Museum.

GRUEBBEL, A. O. New Concepts in Dental Health Education. Health Education J. 6, 3:117 (July), 1948.

Seeing It in Print Helps—This sage advice to dieticians about child feeding "Be ready to listen to the child. He often talks more sense than we realize," carries overtones of meaning for many, many workers in the health field. The whole paper is excellent and comes from one who knows whereof she speaks.

ILG, F. L. The Child's Idea of What and How to Eat. J. Am. Dietet. A. 24, 8:658 (Aug.), 1948.

Fortunate Blunder—Quite by accident the water supply of three New Jersey towns became fluorinated. Nearby are three comparable towns continuing to enjoy fluorine-free drinking water during the 19 years the residents of the first ones were consuming 1.2 to 2.2 p.p.m. of fluorine. No, I won't spoil this story by giving you the nub of the findings here. There is more to come, so you should begin by reading this issue.

KLEIN, H. Dental Effects of Accidentally Fluorinated Water: 1. Dental Caries Experience in Deciduous and Permanent Teeth of School Age Children. J. Am. Dent. A. 36, 5:443 (June), 1948.

Isn't This the Limit?—Conditions producing good general health were found to be associated with severe dental decay, and conversely, poor health was associated with excellent teeth. If that quote doesn't give you pause, as the orators put it, what will?

LARSEN, N. P. Tooth Decay in Relation to Diet and General Health. J.A.M.A. 137, 10:832 (July 3), 1948.

More Bad News—No protective effect following influenza A and B vaccination given 4 to 5 months prior to an outbreak in 1947 was evident among a large group of college students. There was no close antigenic relationship between the viruses in the vaccine and the strain causing the epidemic.

LOOSLI, C. G., *et al.* Results of Vaccination Against Influenza During the Epidemic of 1947. J. Lab. & Clin. Med. 33, 7:789 (July). 1948.

Politely Disagreeing—This is an answer to Wolman's suggestions that we go slow in the medication of municipal

water supplies with fluorine, and that we "wait and see." The writer balances the probable advantages and *known* disadvantages and says let's get going.

NICHOLS, M. S. Supplementing Water Supplies with Fluorine. J. Am. Water Works A. 40, 7:751 (July), 1948.

Nest Egg—Here's something there should be more of! The nurses have worked hard to determine how much it costs to make a home visit and to give other nursing services. Doesn't anyone care how much other public health activities cost?

REID, M. What Does Public Health Nursing Cost? Pub. Health Nurs. 40, 8:399 (Aug.), 1948.

Department of Syphilologic Ignorance—Just because penicillin seems to be resolving most of our therapeutic problems concerned with syphilis, there is no reason for our dropping all the experimental researches that need to be done before we know enough about that infection. The amazing extent and diversity of our syphilologic naivete will be clear to anyone who skims this review.

STOKES, J. H., and BEERMAN, H. Some Problems in the Biology of the Syphilitic Infection. Am. J. M. Sc. 215, 4:461 (Apr.), 1948.

It Works: They Say—In five representative cities, health or city planning officials used our housing appraisal form and found it helpful in determining where sub-standard dwellings exist, why they are sub-standard, and what can be done about them.

TIBONI, E. A., *et al.* Systematic Inspection of Sub-Standard Housing. American City. 63, 5:82 (May), 1948.

Sporting Event—Do you enjoy witnessing an occasional good, clean fight? Then you'll rise to the expert drubbing this Swedish proponent of BCG vaccination administers to a distinguished British opponent. This is all aside from the merits of the cause of the battle royal, quite naturally. A following paper on BCG vaccination should be read, too.

WALLGREN, A. B.C.G. Vaccination: Is It of Any Value in the Control of Tuberculosis? (and) MALMROS, H. The Efficacy of B.C.G. Vaccination. British M. J. 4562:1126 (June 12), 1948.

ASSOCIATION NEWS

SEVENTY-SIXTH ANNUAL MEETING
AMERICAN PUBLIC HEALTH ASSOCIATION
BOSTON, MASS., NOVEMBER 8–12, 1948

Hotel Reservations at Boston

Members are asking which is the "Headquarters" hotel for the Boston Annual Meeting. The answer is that no one hotel has been designated headquarters for delegates because Boston's hotels, though numerous, are not large.

A Housing Bureau is being operated for the Association by the Boston Convention Bureau. We are asking members to select their own hotel from among those listed on page 1178. The application should be carefully filled in and mailed to:

The Housing Bureau
Boston Chamber of Commerce
80 Federal Street
Boston, Mass.

Convention activities will center largely in Mechanics Building. We rearrange the list of hotels below to show you their location with relation to Mechanics Building. No. 1 is nearest, 2 next in order of distance, and so on.

1—Hotel Minerva	6—Hotel Statler	16—Hotel Manger
2—Copley Square Hotel	7—Hotel Bradford	16—The Parker House
3—Copley Plaza Hotel	8—Hotel Touraine	17—Hotel Continental
4—Hotel Lenox	9—Hotel Puritan	13—Hotel Kenmore
5—Hotel Gardner	10—Hotel Somerset	14—Hotel Braemore
5—Hotel Hemenway	11—Hotel Myles Standish	15—Hotel Bostonian
5—Hotel Vendome	12—Hotel Sheraton	16—Hotel Bellevue

Single rooms are few and are hard to obtain. Rooms for double occupancy are strongly recommended. There is no question about the ability of Boston's hotels to accommodate the delegates to the Annual Meeting, but the Housing Bureau and the Local Committee ask the coöperation of the membership in seeking double rather than single room accommodations.

A.P.H.A. membership application blank on page XXXV

THE 76TH ANNUAL MEETING
Boston, Mass., November 8–12, 1948
Hotel Reservation Form

The hotels listed below have rooms available for Association delegates at the rates indicated. Please note that NO RESERVATIONS WILL BE ACCEPTED DIRECTLY BY HOTELS. Make your reservation through:

The Convention Bureau, Boston Chamber of Commerce, 80 Federal Street, Boston 10, Mass.

Hotels	*Singles*	*Doubles*	*Twin Beds*	*Suites*
Bellevue	$4.00–$6.00	$6.00–$8.00	$7.25–$10.00	$12.00–$15.00
Bostonian	3.00– 4.50	5.00– 6.50	5.00– 7.00	8.00– 10.00
Bradford	4.00– 6.00	6.00– 7.00	6.50– 8.00	12.00– 14.00
Braemore	4.40– 6.60	6.40– 9.90	6.60– 9.90	9.90– 25.00
Continental	3.50– 4.00	6.60	7.00	8.00– 25.00
Copley Plaza	4.50– 6.60	7.75– 8.80	8.80– 10.00	15.00– 25.00
Copley Square	4.00– 5.00	6.00	7.00	10.00– 14.00
Gardner	2.50– 5.00	4.00– 6.00	4.00– 6.00	7.50
Hemenway	3.00– 3.85	4.40– 5.50	4.40– 5.50	None
Kenmore	4.00– 6.00	6.50– 8.50	6.50– 8.50	10.00– 12.50
Lenox	3.75– 5.00	5.50– 6.50	7.50	10.00– 16.00
Manger	3.85– 5.50	5.00– 7.50	5.50– 7.50	None
Minerva	3.00– 5.00	4.00– 6.00	5.00– 7.00	5.00– 8.00
Myles Standish	3.85– 6.50	5.50– 7.50	6.50– 7.50	6.50– 15.00
Parker House	4.00– 6.50	6.25– 8.50	7.50– 10.00	14.00– 16.00
Puritan	4.40– 6.60	6.60– 8.80	9.90	13.20– 17.60
Sheraton	4.00– 4.50	7.00– 8.00	7.00– 8.00	7.00– 16.00
Somerset	5.00– 9.00	7.00–11.00	7.00– 11.00	10.00– 20.00
Statler	4.00– 9.50	6.50–12.00	8.50– 14.00	17.50– 27.00
Touraine	4.00– 6.00	6.00– 9.00	7.50– 9.00	14.00– 16.00
Vendome	3.75– 7.00	5.50– 8.75	6.50– 8.75	10.00– 15.00

MAKE ROOM RESERVATIONS EARLY

APPLICATION FOR HOTEL ACCOMMODATIONS
AMERICAN PUBLIC HEALTH ASSOCIATION

76th Annual Meeting and Meetings of Related Organizations, Boston, November 8–12, 1948

(Note that the Meeting opens Monday, November 8, at 9.30 A.M.)

Please make hotel reservation as indicated below:
Give three choices of hotels.

Hotel ..... 1st Choice; Hotel ..... 2nd Choice; Hotel ..... 3rd Choice

.... Room with Double Bed at $..... per day for .... persons
.... Room with Twin Beds at $..... per day for .... persons
.... Room for three people at $..... per day for .... persons
.... Single room at $..... per day
.... Suite at $..... per day for .... persons

ARRIVING. NOVEMBER .... Hour ..... LEAVING: NOVEMBER .... Hour .....

Please print (or type) names and addresses of all occupants including persons making reservation.

NAME STREET ADDRESS CITY STATE

.....
.....
.....

Name .....
Street Address .....
City ..... State .....

MAIL TO: The Convention Bureau, Boston Chamber of Commerce, 80 Federal St., Boston, Mass.

RESERVATIONS WILL BE HELD UNTIL 6:00 P.M. ONLY, UNLESS THE HOTEL IS NOTIFIED OF LATE ARRIVALS

PROPOSED AMENDMENTS TO CONSTITUTION OF THE AMERICAN PUBLIC HEALTH ASSOCIATION

THE Committee on Constitution and By-laws presents herewith for the information of the Fellowship certain proposed amendments to the Constitution of the American Public Health Association. The changes proposed affect the voting privileges of members and Fellows and they grow out of a careful consideration of the subject given by the Executive Board and the committee in an attempt to broaden the basis of participation in Association affairs.

Four amendments will be necessary to put into effect the changes that have been recommended by the Executive Board and approved by the Committee on Constitution and By-laws and by the Governing Council, and they occur in Section 2 of Article III, Sections 1 and 2 of Article IV, and in Article VIII of the present Constitution. Amendments No. 1 and No. 2 provide for the election of the ten elective members of the Governing Council by the members and Fellows instead of by Fellows only; Amendment No. 3 clarifies the terms of newly elected Councilors which begin with the first meeting of the new Governing Council which is held immediately after the old Governing Council adjourns; Amendment No. 4 provides for a mail vote by Fellows on amendments to the Constitution instead of restricting this important responsibility to the Fellows present and voting at an Annual Meeting. Another important change that has been proposed is to allow members and Fellows to vote in a mail ballot for the elective members of the Governing Council instead of limiting the balloting to the time of the Annual Meeting. However, this change involves an amendment to the By-laws which will be presented for the consideration of the Governing Council at the Boston Annual Meeting, together with certain other By-law changes that have been recommended.

The attention of the Fellows is directed to the fact that in these suggested modifications of the present system no change is proposed in the exclusive right of Fellows to hold office in the Association and in the Sections, to serve as chairmen of committees and as members of standing committees, and to vote upon amendments to the Constitution.

The four amendments were submitted to the 106 members of the Governing Council of the Association in a memorandum from the Executive Secretary dated and mailed July 20 and were overwhelmingly approved.

The entire Constitution is reprinted below and the amendments are clearly indicated in the sections concerned. The amendments will be adopted if approved by a two-thirds vote of the Fellows of the Association present and voting at the Boston Annual Meeting in November.

NOTE: Amendment No. 1 is shown in Article III, Membership, Section 2.

Amendment No. 2 is shown in Article IV, Governing Council Composition, Section 1, paragraph (e).

Amendment No. 3 is shown in Article IV, Governing Council Composition, Section 2.

Amendment No. 4 is shown as an entire revision of Article VIII, Amendments.

In these sections, new material is in **bold face type** and material to be deleted is in parentheses.

CONSTITUTION OF THE AMERICAN PUBLIC HEALTH ASSOCIATION SHOWING AMENDMENTS PROPOSED FOR ADOPTION AT THE BOSTON ANNUAL MEETING

ARTICLE I NAME

The name of this Association, incorporated under the laws of Massachusetts, is the American Public Health Association.

ARTICLE II OBJECT

The object of this Association is to protect and promote public and personal health.

ARTICLE III MEMBERSHIP

Section 1. There shall be seven classes of constituents to be designated as Fellows, Honorary Fellows, Members, Sustaining Members, Life Members, Affiliated Societies, and Regional Branches.

Section 2. The right to hold office, except the office of Vice-President, or to serve as a member of the Governing Council, the Executive Board, or of a Section Council, or of a standing committee, or as the chairman of a committee of the Association or of a Section, or to vote (for elective Councilors or) on any amendment to the Constitution shall be limited to Fellows and to Life Members and Honorary Fellows who have been elected Fellows of the Association.

Section 3. The qualifications of the several classes of constituents, and the dues of each of them, the manner of their election, and their rights and privileges, except as specified in this Constitution, shall be established in the By-Laws.

ARTICLE IV GOVERNING COUNCIL COMPOSITION

Section 1. There shall be a Governing Council which shall consist of:

(a) The officers of the Association and the elective members of the Executive Board.

(b) The Chairman, Vice-Chairman, and Secretary of each Section, and the elective members of the Council of the Health Officers Section.

(c) One representative to be designated by each Affiliated Society.

(d) One representative to be designated by each Regional Branch.

(e) Thirty members of the Council, to be elected by the (Fellowship) **Fellows and Members** of the Association, for three-year terms, one-third of whose terms shall expire each year. Such members of the Council shall be known as elective Councilors and shall be nominated and elected as provided for in the By-Laws. If an elective Councilor is elected a Section Chairman, Vice-Chairman, or Secretary, or an elective member of the Council of the Health Officers Section, or appointed the representative of an Affiliated Society, or of a Regional Branch, a Councilor to fill such vacancy shall be elected by the Governing Council. All vacancies while in office shall be filled by election for the unexpired term. After two consecutive terms, an elective Councilor shall be ineligible for reëlection to the Council during one Association year.

Section 2. The terms of all Councilors, except the representatives of Affiliated Societies and Regional Branches, shall begin (at the end of the annual meeting at which they are elected) **immediately following the adjournment sine die of the Governing Council in existence at the time of their election** and shall terminate (at the end of) **with the adjournment sine die of the Governing Council at** the annual meeting at which their respective terms expire; provided that newly elected Councilors shall have the right to attend meetings of the Council in an advisory capacity as soon as elected.

The terms of the representatives of Affiliated Societies and Regional Branches shall begin and terminate in accordance with the constitutions and by-laws of their respective organizations.

Section 3. The Officers of the Association shall be the Officers of the Council.

Section 4. A Quorum of the Council shall consist of twenty Councilors.

Section 5. Meetings of the Council shall be called by the Executive Secretary at the request of the President, or at the request in writing of any twelve Councilors. In the latter case, the call to the meeting shall be issued at least twenty days in advance of the meeting and shall state the purpose for which it is called.

ARTICLE V GOVERNING COUNCIL FUNCTIONS

The functions of the Governing Council shall be:

Section 1. To establish and amend the By-Laws of the Association.

Section 2. To establish policies for the Association and for the guidance of the Executive Board and the Officers.

Section 3. To consider all resolutions proposed for approval in the name of the Association, and to receive and act upon a report from a committee on resolutions appointed annually by the President.

Section 4. To approve all standards promulgated in the name of the Association.

Section 5. To receive at its first session at the time and place of the annual meeting of the Association, a report from the Chairman of the Executive Board in which the work, the

accomplishments, and the financial status of the Association during the year preceding such annual meeting shall be reviewed and a statement made of the major activities contemplated for the ensuing year.

Section 6. To establish Sections of the Association; to combine or discontinue them when necessary; to prescribe the qualifications of the members of Section Councils and the chairman of section committees; to maintain coördination among Sections; and to formulate general rules governing their policies.

Section 7. To elect the Executive Board, the officers of the Association, with the exception of the Chairman of the Executive Board and the Executive Secretary, to elect Fellows, Honorary Fellows, Life Members, and Affiliated Societies, and to establish Regional Branches.

Section 8. To publish after each of its meetings an abstract of the minutes of such meeting.

ARTICLE VI. OFFICERS

The officers of this Association shall be a President, a President-elect, three Vice-Presidents, an Executive Secretary, a Treasurer, and the Chairman of the Executive Board. The officers, with the exception of the Chairman of the Executive Board and the Executive Secretary, shall be elected by written ballot of the Governing Council as provided in this article and in the By-laws. The President-elect shall serve as such from the close of the annual meeting at which he was elected to the close of the next annual meeting, when he shall automatically become President. As President he shall serve to the close of the next succeeding annual meeting. However, in case of the inability of the President to complete his term for any reason, the President-elect shall at once succeed to the duties of President, filling the unexpired term of his predecessor and his own term consecutively. Other officers, except the Chairman of the Executive Board and the Executive Secretary, shall serve from the close of the annual meeting when elected until the close of the next annual meeting, and all officers shall serve in any case until their successors are elected and qualified. A majority vote of the Councilors voting shall be required to elect, and if no candidate receives a majority vote on the first ballot, the candidate receiving the smallest number of votes shall be dropped after each ballot in succession until a majority vote is obtained. The Chairman of the Executive Board and the Executive Secretary shall be elected by the Executive Board, which Board shall define the duties and authority of these officers, respectively.

ARTICLE VII EXECUTIVE BOARD

Section 1. There shall be an Executive Board, consisting of the President, the President-elect, the Treasurer, and six members, to be known as the Elective Members, elected for terms of three years each by the Governing Council. The Elective Members shall be at the time of their election past or present members of the Governing Council. The terms of the Elective Members shall begin at the close of the annual meeting at which they are elected and terminate at the end of the annual meeting at the expiration of their respective terms. The terms of two Elective Members shall expire each year in rotation.

Section 2. Acceptance of membership on the Executive Board shall terminate any appointment such Fellow may hold on any of the standing committees of the Association.

Section 3. It shall be the duty of the Executive Board to direct the administrative work of the Association; to act as the Trustee of the Association's properties; to elect the Members and Sustaining Members; and in general to carry out the policies of the Governing Council between meetings of the latter.

It may designate an Assistant Treasurer whose powers shall be limited to the disbursement of funds in accordance with duly authorized budgets for the ordinary conduct of Association business. Such power shall be exercised only during a period when, in the opinion of the Board, an emergency is created due to the absence or disability of the Treasurer. Such Assistant Treasurer may be a Fellow or a corporate fiduciary institution.

In the event of a vacancy in the office of Treasurer, the Executive Board shall have power to elect a Fellow to serve as Treasurer for the unexpired term.

It shall have such further powers and duties as may be prescribed in the By-Laws .

Section 4. A Quorum of the Executive Board shall consist of five members.

ARTICLE VIII AMENDMENTS

This Constitution may be amended by the Fellows of the Association voting thereon in a ballot cast by mail, provided that the specific amendment to be acted upon is published in the official publication of the Association not less than thirty days prior to the mailing of the ballots to the Fellows by the Administrative Office, and provided further that the amendment has received prior approval by the Governing Council. The closing date for the reception of ballots shall be forty-five days from the date of the mailing of the ballots

by the Administrative Office. An amendment shall become effective only upon receiving an affirmative vote on two-thirds of the ballots cast by the Fellows. The President shall designate Tellers to canvass the ballots and to report the result to the Governing Council as provided in the By-Laws.

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

Martin F. Buell, M.D., 40 S. Washington St., Easton, Mich., Private Practice

Percy F. de Caires, M.B., M.P.H., P. O. Box 199, Georgetown, British Guiana, Health Officer, British Guiana Medical Dept., and Chief Medical Officer, Mosquito Control Service.

Melville D. Dickinson, Jr., M.D., M.P.H., PHWS, GHQ, SCAP, APO 500, Postmaster, San Francisco, Calif., Chief, Tuberculosis Control Branch, Dept. of the Army, Consultant to the Japanese Government in matters of Tuberculosis, Maternal Infancy, and Child Health

Carlos Diez Fernandez, M.D., Sanatorio Antituberculoso de Oriente, Cumana, Estados Sucre, Venezuela, S. A., Jefe Medico

Lt. John D. Glismann, M.C., Kyoto Military Government Team, APO 301, San Francisco, Calif., Public Health Officer

Leslie P. Landsdown, M.D., D.P.H., Swan Valley Health Unit, Swan River, Manitoba, Canada, Director

John M. McGarry, M.B., D.P.H., St. Catharines-Lincoln Health Unit, Niagara-on-the-Lake, Ontario, Medical Officer of Health

John C. McSween, M.D., 803 North Palafox St., Pensacola, Fla., Asst. Public Health Officer, Escambia County Health Dept.

Otto A. Moellmer, M.D., Rupert, Idaho, Physician and Surgeon, General Practice

Daniel Orellana, M.D., M.P.H., San Lorenzo a Rosario 98, Caracas, Venezuela, S. A., Director, El Valle Health Center, National Dept. of Public Health

Mila E. Rindge, M.D., M.P.H., Boston Post Road, Madison, Conn., Field Training

William P. Smith, 1018 Orange Ave., Cranford, N. J., Health Officer, Township of Cranford

Irene M. Sousa, R.N., 2664 E. 37th St., Los Angeles, Calif., Nurse, General Petroleum Corp.

Valentin E. Wohlauer, M.D., Akron, Colo., City Health Officer

Franklin D. Yoder, M.D., M.P.H., Capitol Bldg., Cheyenne, Wyo., Director, State Dept. of Public Health

Laboratory Section

George Adams, M.D., Ph.D., U. S. Marine Hospital, 210 State St., New Orleans, La., Chief of Laboratory, U.S.P.H.S.

Ralph O. Anslow, D.V.M., 620 Infantry Post, Fort Sam Houston, Tex., Chief, Veterinarian and Virus Sections, Fourth Army Area Medical Laboratory

Orlin K. Fletcher, Jr., M.P.H., 205 11th Ave. E., Box 211, Cordele, Ga. Biologist, State Dept. of Public Health

Vital Statistics Section

Frank C. Bauer, 11076 S. Esmond, Chicago, Ill., Chief, Public Health Methods, Dept. of Health

Edith G. Bayers, 1493 Cambridge St., Cambridge 39, Mass., Record Librarian, Cambridge City Hospital

Alma Blum, Niagara Sanatorium, Lockport, N. Y., Medical Record Librarian

Mary A. DeSelms, Children's Hospital, Akron, Ohio, Medical Record Librarian

John Eaton, 2409 Niles St., Bakersfield, Calif., Statistical Clerk, Kern County Dept. of Public Health

Mary S. Hartell, 1105 Divisadero, Fresno, Calif., Medical Record Librarian, Fresno Community Hospital

Helen D. McGuire, M.A., 4518 Maple Ave., Bethesda 14, Md., Public Health Analyst, U.S.P.H.S.

Verna Mings, 226 N. Kuakini St., Honolulu, T. of Hawaii, Medical Record Librarian, Kauikeolani Children's Hospital

Gwendolyn M. Perkins, 1633 Que St., N.W., Washington, D. C., Public Health Analyst, U.S.P.H.S., Division of Public Health Methods

M. Berneta O. Stallings, R. No. 2, Marion, Ind., Medical Record Librarian, Marion General Hospital

Engineering Section

Hyman Kolkowitz, M.S., Shikoku Military Government Region, APO 1050, San Francisco, Calif., Sanitary Engineer

Joseph J. Maguire, 331 State Office Bldg., Providence, R. I., Supervising Sanitarian,

State Dept. of Health, Division of Sanitary Engineering

Charles A. Morse, Jr., Route 3, Winchester, N. H., Sanitary Engineer, Area Hygiene Officer, International Refugee Organization

Harold Romer, M.C.E., 75 Prospect Park, S.W., Brooklyn 15, N. Y., Sanitary Engineer, Veterans' Administration

Industrial Hygiene Section

Donald V. Cooney, M.D., Merchant Marine Medical Service, 531 W. 18th St., New York 11, N. Y., Medical Director

Paul L. Gradolph, M.D., 18934 Oak Drive, Detroit 21, Mich., Consultant in Industrial Medicine

Donald G. Nelson, M.D., D.P.H., Box 65, Milton, Ontario, Canada, Officer Commanding, Royal Canadian Airforce, Hospital Rockcliffe, Ontario

Food and Nutrition Section

Miriam E. Lowenberg, Ph.D., 115½ First Ave., S.W., Rochester, Minn., Nutritional Supervisor, Rochester Child Health Institute

Marion H. Wolf, M.S., 924 Royal, New Orleans, La., Nutritionist, State Dept. of Health

Maternal and Child Health Section

John T. Gray, M.D., 400 West Markham St., Little Rock, Ark., Medical Director, Crippled Children's Division, State Dept. of Public Welfare

Isabelle M. Jordan, 2716 Wisconsin Ave., Apt. 2, Washington 7, D. C., Specialist in the Nursing Care of Children, Division Research Child Development, Children's Bureau, Federal Security Agency

Olisa D. Ndukwe, M.D., D.P.H., 39 Queens Gate Gardens, London S.W. 7, England, Student

Public Health Education Section

Carolyn Gilbert, M.N., Eastern Illinois State College, Charleston, Ill., Health Coördinator

Zelda V. Guttman, M.S., 12–26 31st Ave., Long Island City 2, N. Y., District Secy., Astoria-Long Island City Health Council

Doris M. Healey, 86 Broadway, Newburg, N. Y., Exec. Secy., Newburg Public Health and Tuberculosis Assn.

Margaret Labock, 129 South Front St., Philipsburg, Pa., Dental Health Educator, Bureau of Dental Health, Dept. of Health

Daniel O. Leatherman, 921 Muirfield Ave., Waukegan, Ill., Senior Program Secretary and Physical Director, Young Mens Christian Assn.

Lawrence L. Luther, 6 Commonwealth Ave., Boston, Mass., Director, Massachusetts Blood Program, American National Red Cross

Patricia A. Maloney, M.S., Rensselaer County Health Dept., Troy, N. Y., Health Educator

Ernest M. Sable, 330 Brookline Ave., Boston 15, Mass., Administrative Intern, Beth Israel Hospital

Claire Schiffman, 11319 Fairport, Cleveland 8, Ohio, Health Educator, Cleveland Division of Health

J. Albert Torribio, 116 W. Temple St., Los Angeles 12, Calif., Public Health Educator, City Health Dept.

Carl B. Young, Jr., 3325 Del Monte Drive, Houston, Tex., Student, Univ. of North Carolina, School of Public Health

Public Health Nursing Section

Edith E. Dickson, 1601 E. St., Lawton, Okla., Student, Univ. of Colorado, Public Health Nursing Curriculum

Betty Ficquett, R.N., M.P.H., 2795 Vernon Terrace, Jacksonville, Fla., State Nursing Consultant, State Board of Health

Helen M. Green, R.N., 44 Garden St., Hartford, Conn., Public Health Nursing Consultant, State Tuberculosis Commission

Alice B. Hardy, 767 Chalkstone Ave., Providence, R. I., Nursing Field Representative, American Red Cross

Dorothy S. Hayward, 261 Franklin St., Boston, Mass., Asst. Exec. Secy., Boston Health League

Myrtle Horton, 2614 W. 15th, Little Rock, Ark., Orthopedic Nursing Consultant, Crippled Children's Division, State Welfare Dept.

Ina J. Jensen, Public Health Nursing Service, Gaylord, Minn., Sibley County Nurse

Helen H. Johnson, R.N., 3964 S. Broadway, Englewood, Colo., Student, Univ. of Colorado

Zada N. Keefer, City Hall, Room 309, Toronto, Ontario, Canada, Director, Division of Public Health Nursing, Dept. of Public Health

Emma P. M. Manfreda, R.N., 248 N. Main, Wallingford, Conn., Student, Teachers College, Columbia Univ.

Beatrice A. McHarg, P. O. Box 411, Salt Lake City 9, Utah, Public Health Nurse, Salt Lake City Board of Health

Lucille E. Notter, M.A., 1949 McGraw Ave., New York 62, N. Y., Asst. Director, Visiting Nurse Service of New York

Blanca R. Otero-Nazario, Principal St., Box 37, Morovis, Puerto Rico, Public Health Nurse, Dept. of Health

Agnes V. Peterson, 2426 B. Kuhio Ave., Apt. D, Honolulu, T. of Hawaii, Tuberculosis Nursing Consultant, Territorial Dept. of Health

Clara E. Richmond, M.A., 155 E. 54th St., New York 22, N. Y., Nursing Consultant, Health Insurance Plan of Greater New York

Esther A. Schisa, R.N., 971 Westmoreland Ave., Syracuse 10, N. Y., Asst. District Public Health Supervising Nurse, New York State Dept. of Health

Helena E. Tavernetti, 416 Salinas National Bank Bldg., Salinas, Calif., Exec. Secy., Monterey County Tuberculosis and Health Assn.

Rhoda A. Willard, B.S.N., 2003 Tenth St., Bay City, Mich., Field Worker, Wayne University

Mary C. Wolking, 1828 Cypress Ave., San Diego, Calif., Director of Public Health Nurses, San Diego County Health Dept.

School Health Section

Thomas E. Eyres, M.D., M.P.H., 18 N. University, Vermillion, S. D., Professor of Public Health, Univ. of South Dakota

Frank V. Powell, 146 N. State Capitol, Madison, Wis., Director, Bureau for Handicapped Children

Marie Swanson, R.N., M.A., 1790 Broadway, Room 1004, New York 19, N. Y., Asst. Director, National Organization for Public Health Nursing

Lorna W. Thigpen, Ph.D., State Teachers College, Health Cottage, River Falls, Wis., Health Instructor

Dental Health Section

Ross E. Gutman, D.D.S., M.P.H., 2151 Walton Ave., New York 53, N. Y., Dentist

Glenn T. Mitton, D.D.S., D.D.P.H., 294 Glengrove Ave., W., Toronto 12, Ontario, Canada, Assoc. Professor, Faculty of Dentistry, Univ. of Toronto

Unaffiliated

Arthur N. Aitken, M.D., Niagara Sanatorium, Lockport, N. Y., Director, Tuberculosis Hospital

Abraham Azulay, M.D., U.S.P.H.S. Medical Center, Hot Springs, Ark., Ward Officer

Walter E. Batchelder, M.D., State Office Bldg., Div. of Cancer Control, Providence 2, R. I., Medical Director

Lawrence A. Brennan, M.S., 2404 Greeley, Kansas City, Kans., Health Program Representative, U.S.P.H.S.

Henry Toole Clark, Jr., M.D., Vanderbilt University Hospital, Nashville, Tenn., Director

Aileen E. Foley, Johns Hopkins Hospital, Baltimore 5, Md., Administrative Intern

John Garb, M.D., 219 E. 19th St., New York 3, N. Y., Physician specializing in Dermatology and Syphilology

Sarah E. Judy, 150 N. Clay Ave., Ferguson 21, Mo., Information Specialist, National Cancer Institute

Margaret C. Klem, 1726 M Street, N.W., Washington 6, D. C., Chief, Medical Economics Section, Bureau of Research and Statistics, Social Security Administration

David Littauer, M.D., 4949 Rockhill Road, Menorah Hospital, Kansas City 4, Mo., Director

E. J. MacNamara, State Office Bldg., Room 529, Harrisburg, Pa., Comptroller, State Dept. of Health

James W. Marine, 2240 Mt. Curve, St. Joseph, Mich., Administrative Intern, Community Hospital, Battle Creek

Maynard W. Martin, M.D., 5535 Delmar Blvd., St. Louis 12, Mo., Director, St. Lukes Hospital

John O. Meetze, Wade Hampton Office Bldg., Columbia 1, S. C., Director of Finance, State Board of Health

Ida L. Sherman, M.S., 25 Evelyn Way, N.W., Atlanta, Ga., Statistician, Communicable Disease Center, U.S.P.H.S.

Paul A. T. Sneath, M.B., M.D., D.P.H., Medical Hqs., Dar-es-Salaam, Tanganyika Territory, East Africa, Director of Medical Services, Colonial Medical Service

Frank Waldo, Pittsburgh Plate Glass Co., 5th at Bellefield, Pittsburgh 13, Pa., Manager, Pittchlor, Pittcide Sales, Columbia Chemical Division

Mildred F. Walker, 2716 Wisconsin Ave., N.W., Washington, D. C., Consultant in Hospital Administration, U. S. Children's Bureau, Federal Security Agency

Robert L. Worthington, M.D., 3617 W. 6th St., Topeka, Kans., Medical Director, Menninger Sanitarium

J. B. Yutzy, 417 E. 13th St., Kansas City 6, Mo., Administrative Analyst, U.S.P.H.S.

First Annual Conference of Fiscal, Business, Personnel and Planning Officers of State and Territorial Departments of Health

A group of administrative officers are desirous of organizing all health department officers concerned with Administrative Management (Fiscal, Business, Personnel, and Planning and Procedures) into one group or organization to provide a means for interchange of information, discussion of problems and ideas pertinent to this important phase of health department organization and administration.

It was agreed that membership in the American Public Health Association would give us the contacts and provide the facilities at the Annual Meetings to achieve our objective.

Accordingly, a committee was appointed to further this organization idea. The committee has circularized all health department officers concerned with administrative management whose names were furnished by the state and territorial health officers, and the response in A.P.H.A. membership applications has been sufficiently successful to warrant a conference.

This conference will be devoted primarily to formal organization of the group, election of temporary officers, appointment of committees, and laying plans for next year's conference.

All health department officers engaged in administrative management are invited and urged to attend this conference. Please refer to the program of the A.P.H.A. Annual Meeting in Boston for particulars as to time and place.

LETTER TO THE EDITOR

To the Editor:

Many thanks for sending me a copy of Colonel Hardenbergh's comment concerning my article in the July number of the *American Journal of Public Health*. His complaint is entirely justified. My apologies to him and to the U. S. Army and Navy for failing to mention the impressive amount of antimalaria work accomplished within military establishments in the Continental United States during the war years. That these preventive efforts contributed significantly to the minimal malaria experience of the Armed Forces in this country during World War II can hardly be doubted.

I am very sorry that the omission occurred. I can hardly claim to be unaware of the cantonmental malaria prevention operations. I suspect that I was so absorbed in the purely civilian phases of my thesis that I failed to include the military accomplishments. The omission was certainly not intentional.

Justin M. Andrews,
Medical Director in Charge, Communicable Disease Center, U. S. Public Health Service, Atlanta, Ga.

August 2, 1948

EMPLOYMENT SERVICE

The following pages present information for those seeking qualified public health personnel and for those seeking positions in public health.

This is a service of the Association conducted without expense to the employer or employee.

Address all correspondence to the Employment Service, A.P.H.A., 1790 Broadway, New York 19, N. Y., unless otherwise specified.

(Supplemental to list in September Journal)

Positions Available

Sanitarian with some college training or practical experience in sanitation for Effingham County, Illinois, population 22,000. Salary range $250 to $290 monthly. Immediate employment. Write: Fred O. Tonney, M.D., Medical Director, Shelby-Effingham Bicounty Department of Health, 511½ West Fayette Avenue, Effingham, Illinois. Tel. 1580; or 206 Morgan Street, Shelbyville, Illinois, Tel. 480.

Sanitarians (two); general environmental sanitation. County population 83,000. Annual salaries $3,600 and $3,120. Write: Irving D. Johnson, M.D., Health Officer, Marin County Health Dept., 704 Fourth Street, San Rafael, Calif.

Laboratory Technician, male or female, for city Health Department laboratory. Must have certificate. Salary $200 monthly. Write: J. M. Cameron, M.D., Health Officer, City Hall, St. Joseph 56, Mo.

Tuberculosis Supervisor: opening for public health nurse with graduate course in TB, B.S. degree and some experience in supervision. Program in generalized visiting nurse association carrying official TB nursing for the city. Affiliation with university. Beginning salary $265 monthly. Retirement plan and progressive personnel policies. Write: Mrs. Elizabeth Martin, Visiting Nurse Assn., 1008 SW 6th Ave., Portland 4, Ore.

Full-time Dentist to serve as dental clinician in rural school dental health program. Salary $5,000 per annum. Appointee will operate a modern mobile dental unit. Write: Mrs. Alfred Chanutin, President, Child Welfare Assn., Room 201, Jefferson Theater Bldg., Charlottesville, Va.

Health Educator for Chicago and Cook County TB Institute with public health background and experience. Salary open. Excellent opportunity for developing broad education in TB control programs in community, industry, and schools in cooperation with the official agency. Write: Elizabeth Dean, Tuberculosis Institute of Chicago and Cook County, 1412 West Washington Blvd., Chicago 7, Ill.

MCH Health Nursing Consultant. Minimum 3 years' experience in public health nursing plus background in maternity and pediatrics. B.S. Civil Service status. Permanent.

TB Nursing Consultant. Minimum three years' experience in supervisory or consultant position with public health agency. Experience in TB control. B.S. Civil Service status. Permanent. Write: Harold M. Erickson, M.D., State Health Officer, 1022 S. W. 11th Avenue, Portland 5, Ore.

Supervisor of Education with Visiting Nurse Agency offering affiliations with two colleges. Experience in Supervision with a Voluntary Public Health Nursing Agency an essential. Salary range $2,800 to $3,200. Write **Box A-29,** Employment Service, A.P.H.A.

Health Educator for generalized full-time public health program; atomic energy project Pacific Northwest; salary depending upon experience and training; 40 hour week; complete community and plant program; M.P.H. required. Write or wire: Administrator, Kadlec Hospital, Richland, Wash.

Sanitarian. Principal duties—restaurant sanitation and milk control. Other duties relating to sanitation as assigned. Salary open. Knowledge of sanitary chemistry and bacteriology essential. Write: Health Officer, City and County Health Dept., 315 West 20th Street, Cheyenne, Wyo.

Teacher—Man, Ph.D. desired, but Master's degree in Health Education plus experience will be considered. Salary and rank will depend upon training and experience. Southern State University. Opportunities in newly organized department. Teach Hygiene, Health, and Physiology. Write: **Box A-30,** Employment Service, A.P.H.A.

Superintendent—for large New York City Ambulatory Clinic. Experience in all phases OPD administration and super-

vision. Experience in purchasing, personnel management, and maintenance. Good working knowledge of medical supplies, record keeping, statistics, accounting, etc. Give qualifications, stating training, experience, age, expected salary. Write **Box A-31**, Employment Service, A.P.H.A.

Public Health Staff Nurses needed in La Crosse City Health Dept. Newly revised generalized program. Opportunity to work under highly qualified supervision. Starting salary $2.721. Car furnished. Write: Chairman, Board of Health, City Hall, La Crosse, Wis.

Public Health Nurses—three vacancies; applicants must be graduate public health nurse with at least one year of experience; age between 21 and 35. Starting annual salary $2811. Car provided. Write: **Box A-32**, Employment Service, A.P.H.A.

Orthopedic Nursing Consultant — Degree with training and experience in public health nursing and orthopedics required. Excellent opportunity to develop and coördinate orthopedic services in community.

Educational Director—Degree with special training and experience in public health nursing.

Child Welfare Consultant—Degree with special training and experience in public health nursing, and well child clinics. Write: Executive Director, The Visiting Nurse Association, 401 Municipal Bldg., Dayton 2, Ohio.

Health Officer—health unit in Western Florida, headquarters at DeFuniak Springs. Population 44,653. Will employ medical doctor at $6,600 per year if trained or experienced, plus travel at 7½¢ per mile for use of own car. If untrained will pay a salary of $6,000 at completion of one month's training and orientation at Field Training Center at $375 per month.

Health Officer — Jefferson County Health Unit, headquarters at Monticello, Fla. If experienced or trained, can pay salary of $6,600 plus travel at 7½¢ per mile for use of own car. If untrained will pay a salary of $6,000 at completion of one month's training and orientation at Field Training Center. Write: Wilson T. Sowder, M.D., State Health Officer, Florida State Board of Health, P.O. Box 210, Jacksonville, Fla.

Supervising Public Health Nurse. Salary $288–$360.

Public Health Analyst. To analyze and interpret morbidity and mortality data relating to communicable diseases, epidemiological studies, health surveys, and vital statistics. Civil Service position. Salary range $273–$341. Sick leave, vacation and liberal retirement plan. Write: R. N. Klein, Director of Personnel, Civil Service Commission, City Hall Annex, San Jose, Calif.

Two **Staff Nurses** in Health Department at Hillsboro, Ill. Salary range $200 to $250 per month. General nursing program. Car required. Liberal allowance for depreciation and mileage. Write: Montgomery County Health Dept., Hillsboro, Ill.

Staff Nurse preferably with public health nursing experience for generalized public health nursing program in a county Health Unit in S.E. Colorado. Salary dependent on qualifications; must own car, mileage paid. Write: Acting Director, Otero County Health Department, 17 West 4th, La Junta, Colo.

Public Health Statistician to direct bureau of health (vital) statistics. Salary $407.08 to $481.67 plus $25.00 monthly bonus. Five years of statistical experience including three years in research and supervisory capacity in public health, graduation from a recognized university with courses in advanced statistics and one year of graduate work in public health, major in public health statistics. Write: air-mail to: President, Board of Health, P. O. Box 3378, Honolulu 1, Hawaii.

Staff Physician for Tuberculosis Sanatorium. 270 beds, salary $4,848. Write: training area. Opportunity for supervised Dr. C. W. Scott, Superintendent, Piedmont Sanatorium, Burkeville, Va.

Sanitary Engineer or Sanitarian, engineering or science degree. Generalized program, rural and urban, two county district. Car necessary, mileage 7¢. Salary open. Write: Director, Delta-Menominee District Health Department, Escanaba, Mich.

Public Health Nurses; Southern Michigan City-County Health Department, field training area. Opportunity for supervised experience and university extension courses. Forty hour week; 4 weeks' annual vacation; liberal sick leave. Salary liberal, systematic increments. Travel allowance. Write: Director, Calhoun County Health Department, Battle Creek, Mich.

Public Health Nurse, preferably with training and experience. County of 35,000 population, 100 miles from Chicago; 3 weeks' vacation, sick leave with pay; $60 monthly travel allowance, monthly salary range $200–$250. Write **Box A-25,** Employment Service, A.P.H.A.

Chief Bacteriologist for State Health Department Laboratory, northeastern U. S. Advanced degree required. Salary $4,170 maximum, depending on qualifications. Write **Box A-28,** Employment Service, A.P.H.A.

Director, Bureau of Tuberculosis, New York City Health Department. M.D., 1 year approved interneship, 1 year residency in approved TB Hospital, 3 years' full-time administrative metropolitan public health experience, 3 years' full-time experience in examination and treatment of TB patients and radiological diagnosis or equivalent. New York State License; blanks must be applied for and delivered personally or by messenger at 299 Broadway, New York City.

Several qualified **Sanitarians.** Bachelor's degree with related science or engineering major and 1 year qualifying experience. Experience in sanitation may be substituted for two years college. Beginning monthly salary $200. Write Merit System Supervisor, Box 939, Santa Fe, N. M.

Two positions for **Staff Nurses,** salary $250–$310; one position for Director of Nursing; Sutter-Yuba Health Dept., Central California, including two counties, urban and rural. Total staff of twenty. Housing available. Salary for Director of Nursing $360. Write. C. A. Scherer, M.D., Health Officer, 309 C St., Marysville, Calif.

Health Educator, with M.P.H. major in health education or equivalent, or degree plus minimum 3 years' public health experience with official or voluntary agency. Salary $3,000–$4,000. To work with metropolitan voluntary health agency, mid-west. Write **Box A-27,** Employment Service, A.P.H.A.

Educational Director for a growing student and staff education program. Salary open. Also several qualified staff nurses, salary $185–$245. Write: Director, Public Health Nursing Association, Des Moines 9, Iowa.

Public Health Nurses for generalized nursing program, salary range $255–$275 per month. Civil Service, 40 hour week, vacation and sick leave privileges. Car furnished. Write: Director of Public Health Nursing, 504 County City Building, Seattle 4, Wash.

Hearing and Vision Consultant. Minimum two years' experience in hearing and vision programs including hearing and vision testing. College graduate with one year graduate training in psychology, speech, or related field. Salary range $3,600 to $4,440. Considerable state-wide travel with per diem of $6.75 and mileage. Permanent; Civil Service status. Write: State Health Officer, Oregon State Board of Health, Portland 5, Ore.

Alaska

Public Health Nurses, well qualified with at least 1 year of generalized field experience under supervision. Openings chiefly in one-nurse community, or itinerant services. Minimum requirements include an approved course of study in Public Health Nursing. Salaries begin at $3,960 ($4,554 if assigned to Interior); with annual increase to maximum salary of $4,860 at end of six years ($5,589 if in Interior).

Senior Public Health Nurse or Public Health Nurse-Midwife. Generalized programs in more isolated areas, including itinerant services. Minimum requirements for both include an approved course of study in public health nursing. Senior nurses must have carried comparable senior or supervisory experience in another public health agency having a generalized program. PHN-Midwives must be certified. Salary begins at $4,140 ($4,761 if assigned to Interior); with annual increase to $5,040 ($5,796, if in Interior). All employees receive 30 working days' annual leave plus 2 weeks' sick leave; benefits under Workmen's Compensation Act. Write: Division of Public Health Nursing, Territorial Department of Health, Juneau, Alaska.

District Health Officer and a Director, Communicable and preventable disease control. Graduation from an approved school of medicine, one year's interneship in an approved hospital, master's degree or its equivalent from a recognized school of public health. At least 4 years of progressive and successful experience in the practice of medicine, 2 years of which within the past 10 years shall have been full-time in an administrative position in public health. Merit System status. Annual salary $8,700 to start.

District Representative, MCH and Crippled Children's Services: Anchorage, Alaska. Starting salary with interior differential $8,004 annually. Graduation from an approved school of medicine, one year's interneship in an approved hospital with one year's residency in pediatrics or obstetrics and one year's postgraduate study in public health or one year's specialized interneship in pediatrics or obstetrics and one year's postgraduate study in public health. One year successful practice of medicine also required. Write: C. Earl Albrecht, M.D., Commissioner of Health, P. O. Box 1931, Alaska Department of Health, Juneau, Alaska.

Kentucky

Assistant State Health Commissioner, well qualified, salary open. Public health officers, nurses and other public health personnel. Some are key positions on state and local levels. Write: Bruce Underwood, M.D., State Health Commissioner, Kentucky State Department of Health, Louisville 2, Ky.

Arizona

Arizona Merit System Council announces continuous recruitment for the following positions.

Staff Nurse (Social Security and Welfare)	$200–$230
(State Department of Health)	175– 200
Public Health Nurse Assistant	175– 185
Junior Public Health Nurse	185– 200
Public Health Nurse	200– 240
Senior Public Health Nurse	240– 280
Public Health Nursing Consultant	280– 320
Senior Sanitary Engineer	325– 385
Dental Hygienist	200– 240
Assistant Medical Officer	325– 385
Medical Supervisor—TB Sanatorium	350– 425
Class B—Director of Local Health Unit	425– 485
Class A—Assistant Director of Local Health Unit	425– 485
Clinician in Special Fields	425– 485
Director of TB Control	500– 580
Director of MCH	500– 580
Health Educator	240– 280

For application forms write to: Zilpher Fuller, Merit System Council, Room 104, Winters Building, 39 West Adams Street, Phoenix, Ariz.

Illinois

The Illinois Department of Public Health needs District Health Officers. Salary range $5,760–$6,960, plus travel. Liberal retirement system. Experienced men preferred and will start above minimum salary, with regular raises for satisfactory service. Qualified individuals may be placed in Division Offices of State Department. Possibility of positions in newly established city and county health departments paying approximately $7,000 plus travel, or higher. Only graduates of Class A medical schools and AMA approved interneships considered. Applicants must be willing to take special training on stipend if indicated. Write: Roland R. Cross, M.D., Director, State Department of Public Health, Springfield, Ill.

Kansas

	Salary Range
Director of the Division of Local Health Administration	$6,900–$8,400
Director of Division of Tuberculosis Control	6,000– 7,200
Director of Venereal Disease Control	6,000– 7,200
Epidemiologist	6,000– 7,200
Local Health Officer II	6,000– 7,200
Local Health Officer III	5,100– 6,300
Industrial Hygiene Engineer I	3,900– 4,800
Industrial Hygiene Engineer II	3,300– 4,200

Write to: Division of Personnel
Kansas State Board of Health
Topeka, Kansas

Washington

The Washington State Department of Health announces vacancies of Chief Industrial Hygiene Engineer and Senior Industrial Hygiene Engineer. The former position requires a degree in engineering, preferably chemical engineering and 5 years' experience in engineering (3 in public health including 2 in industrial hygiene). Salary range of $4,800 to $6,000 per annum. The Senior position requires a degree in engineering, preferably chemical or mechanical, and 3 years' experience in engineering (2 in industrial hygiene). Salary range of $3,900 to $4,800. These positions are established Merit System positions with annual and sick leave and retirement benefits. Write: Dr. Arthur L. Ringle, State Director of Health, 1412 Smith Tower, Seattle.

Fellowships

Postgraduate public health Fellowships—A limited number of fellowships are available to physicians for one year of postgraduate study leading to a Master of Public Health degree. This study requires one academic year at a school of public health approved by the American Public Health Association, followed by 3 months of acceptable or approved field training. Awards are based on the individual need of each applicant. Fellowships may cover tuition, maintenance, and an allowance for books, if required. For further information write to: National Foundation for Infantile Paralysis, 120 Broadway, New York 5, N. Y.

POSITIONS WANTED

Public Health Administrator: ten years' public health experience, six of which were spent in charge of health departments with up to a third of a million population. M.D., M.P.H., Fellow Health Officers Section. Available for responsible Public Health, Medical Care, or Medical Administrative position. Willing to start at $12,000 per year, provided there is a reasonable opportunity for increase. Write: **Box C-4,** Employment Service, A.P.H.A.

Public Health Physician seeks position in medical care, mental hygiene program or as health officer in or outside U. S. M.P.H., Harvard University, major medical care and public health practice. Some administrative experience in city health department. National Board Diplomate. Negro, married, 27. Write **Box Ph-7,** Employment Service, A.P.H.A.

Health Educator, woman, M.S. Considerable experience in executive capacity in voluntary agencies, in community organization and group work with adults, school-agers and preparation of material. Interested in health education. Teaching or administrative position. Write: **Box HE-6,** Employment Service, A.P.H.A.

Executive or Associate Position, health or welfare field. M.S.S., 12 years' experience (case work, supervisory, administrative) public and semi-private welfare, health, hospital and community organization agencies. Male. Write: **Box C-3,** Employment Service, A.P.H.A.

Public Health Statistician and Administrator. Thirteen years' administrative, statistical and technical experience in federal and state public health agencies, both foreign and domestic. Five years Director of large division of public health statistics and also State Health Department Registrar. Formal postgraduate training in recognized school of public health. Biostatistics teaching experience in large medical school. Salary open. Available immediately. Write **Box ST-2,** Employment Service, A.P.H.A.

Laboratory Assistant—medical or biological. B.A. biology, physiology; experienced in routine and research medical laboratories. Position in large scientific institution preferred either in laboratory or gathering scientific data in field. Write: **Box L-4,** Employment Service, A.P.H.A.

Veterinarian—M.P.H., experienced in meat inspection and milk hygiene. Formerly in charge of sanitation in Army camps in U. S. and overseas. Will consider part-time with practice opportunity in State of Connecticut and New Jersey. Available immediately. Write: **Box V-6,** Employment Service, A.P.H.A.

Veterinarian with training in bacteriology, organic chemistry and pathology; experience in public health work as a veterinary inspector for large midwestern city and in clinical laboratory procedures. Will consider position in or outside the U. S. Write: **Box V-1,** Employment Service, A.P.H.A.

Engineer, B.E., M.S. in Sanitary Engineering. Eighteen years' experience in construction, including sanitary construction. Desires position in Sanitary or Public Health Engineering with Health Department, Industry or Consulting Engineer, preferably in Texas. Write: **Box E-6,** Employment Service, A.P.H.A.

Sanitary Engineer, M.S.—Six years' experience with Sanitary Corps, federal and private agencies in field of water supply, sewage treatment, insect and rodent control, and general sanitation. Desires position in the East. Write **Box E-5,** Employment Service, A.P.H.A.

Advertisement

Opportunities Available

WANTED—(a) Professor of preventive medicine; should be qualified to teach preventive medicine and public health with a primary emphasis on preventive medical aspects; university medical school; East. (b) Public health physician to direct newly formed city-county health department; headquarters in town of 40,000; Southeast. (c) Student health physician; staff consists of 10 full-time physicians, 60 part-time; opportunity of attending clinics and seminars; university medical school; 9 month year. (d) Chief of bureau of school medical inspection and, also, chief of department of epidemiology; former should be qualified in school health; eastern metropolis. (e) Several physicians qualified in general public health or one of the clinical specialties; opportunities also for physicians interested in obtaining public health training; positions of varying responsibility in city and county health departments; salaries depend upon qualifications, ranging from $5,650 to $10,000; East. (f) Public health physicians to set up local health associations throughout United States; must be willing to travel; administrative public health experience desirable; $8,000-$10,000. (g) Director of medical and health service; national organization; public health physician with administrative experience required; $9,000. **PH10-1**

WANTED—(a) Director of public health nursing; state department of health; $3,800-$4,800; West. (b) Assistant professor of public health nursing; preferably one with Master's degree and supervisory experience; collegiate school; $4,000-$5,000; 10 month year; additional income for summer teaching. (c) Student health nurses; liberal arts college, coeducational; town of 40,000; Middle West. (d) Public health nurse to conduct city tuberculosis nursing program with university affiliation; Pacific Coast. (e) Public health nurse to direct pediatric clinic; duties include directing teaching program for pediatric nursing; university medical center; Southwest. (f) Public health supervisors and staff nurses for positions in South America; knowledge of Spanish or Portuguese desirable. (g) Public health nurse trained in venereal disease investigation and control; town of 25,000; 5 day, 40 hour week; minimum, $66 weekly, early increase; West. (h) Senior and junior public health nurses; generalized program; interesting location in California; salary range, $245-$310. **PH10-2**

WANTED—(a) Dentist with Master's degree in public health; key position with public health agency; West. (b) Public health dentist; well equipped dental clinic; duties principally operative work for underprivileged school children; $4,800, plus $600 for car allowance; Georgia. (c) Public health dentist for field position in Alaska; also, public health dentist to serve on health boat, plying waters near Alaska. (d) Dentist qualified in public health dentistry or children's dentistry; administrative position; voluntary health agency having children's dental clinics in various parts of city and suburbs; East. **PH10-3**

WANTED—(a) Sanitary engineer; faculty appointment; Middle Western university. (b) Health educator; newly created position, municipal health department, Middle Western town of 150,000. (c) Director of new agency organized to care for chronically ill; graduate training in social or public health work, several years' supervisory experience required. (d) Public health engineer; state department of health; Middle West. (e) Statistician to become associated with one of the national professional organizations; duties involve statistics on blood plasma program. (f) Health educator to work with colleges and educators; preferably one who has taught health education in a teachers college; willing to travel; East. (g) Sanitary chemist; working knowledge of chemistry of water or sewage required; chemist with interest in sanitary chemistry eligible; important research; Southwest. (h) Sanitary engineer qualified to handle malaria control work; operation of large industrial company in Africa. **PH10-4**

Advertisement

Opportunities Wanted

Dentist; D.D.S., M.S. degrees; recently received Master's degree in Public Health; has done considerable research work on problem of dental caries; prefers public health dentistry or teaching position in pedodontia; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Chemical engineer; M.S. (Sanitary Engineering); 11 years, division of industrial health, state department of health, 5 years as assistant director and 6 as director; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Health educator; B.S., M.A., degrees, eastern universities; several years, director of physical education in public schools; 4 years, health educator, nationally known organization; 3 years, health educator in industry; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Public health nurse; B.S. in Public Health Nursing; M.A. in Administration; Ed.D. Nursing Education; 7 years, teaching her specialty; 4 years, public health nursing administration; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Public health physician; M.D., and Master's degree in Public Health, eastern universities; 8 years, administrative health officer, principally in rural areas; past 5 years, director large metropolitan health department; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

NEWS FROM THE FIELD

INTERNATIONAL CLASSIFICATION OF DISEASES, INJURIES AND CAUSES OF DEATH ADOPTED

THE International Statistical Classification of Diseases, Injuries and Causes of Death was adopted by the International Revision Conference at its decennial meeting held in Paris, April 26–30, 1948. This sixth decennial revision of the *International List of Causes of Death* provides for the first time a uniform basis for the compilation of both mortality and morbidity statistics to serve the growing needs for a satisfactory classification of causes of illness.

The International Revision Conference, to which delegates from 29 countries were represented, took other significant actions. The Conference adopted a standard form of medical certification of death designed to serve as a basis for the selection of the underlying cause of death for primary mortality tabulations. Also agreed to were the principles and the basic rules for selecting the underlying cause of death which, in the United States, will replace the *Manual of Joint Causes of Death* first introduced in published form in 1914. In regard to future studies of important vital and health statistics problems, the Conference recommended the establishment of national committees to conduct studies and report their findings to the Expert Committee on Health Statistics of the World Health Organization.

The users of the past revisions of the *International List of Causes of Death* may be interested to find that typhoid fever, designated as International List No. 1 through each of the past five decennial revisions, has finally given way to one of the tuberculosis rubrics in the sixth revision. Sweeping changes were incorporated in the *International Statistical Classification of Diseases, Injuries and Causes of Death*, but most of these changes were made within the general structure of the *International List of Causes of Death*. Of particular significance was the expansion of the list from 450 to 610 categories for diseases and morbid conditions, plus 153 categories for the classification of the external causes of injuries and 189 categories for the characterization of injuries according to their nature. The classifications of injuries are supplements to the disease code, and either the classification according to the external circumstances of the violence or the classification by the nature of injury, or both, may be used.

The new classification consists of obligatory three-digit categories and optional fourth digit subdivisions. The numbering system employed in the code is adapted to mechanical tabulating equipment in contrast to that of the past revisions which required translation of the code from alphabetic to numeric and back to alphabetic in the final tabulations.

The *International Statistical Classification of Diseases, Injuries and Causes of Death* will be published by the World Health Organization in two volumes. The first volume will consist of the introduction, list of categories, the tabular list of inclusion terms, medical certification and rules of classification, and special tabulation lists. The second volume will consist of the alphabetical index of terms and an appendix of rules for coding the underlying

cause of death. It is expected that the two volumes will be available for distribution by January, 1949, when the new classification will be introduced. The World Health Organization will also issue a French and a Spanish edition of the classification.

The international adoption of the new list is a source of gratification to the United States, since it was the U. S. Committee on Joint Causes of Death that produced the original draft of the morbidity-mortality classification. It may be remembered that the U. S. Committee on Joint Causes of Death was one of the recipients of the 1947 Lasker Awards for its work on the classification list. The U. S. Committee on Joint Causes of Death submitted the proposed classification in 1946 to the Expert Committee of the World Health Organization on the Preparation for the Sixth Decennial Revision of the International Lists of Diseases and Causes of Death. The Expert Committee made some modifications in the list after submission to various governments for criticisms and suggestions. The extensive preparatory work which started in 1945 culminated in the unanimous adoption of the classification at the Paris Conference in April, 1948.

The delegates to the International Revision Conference from the United States were: Dr. Halbert L. Dunn, Public Health Service (Chairman); Dr. George Baehr, New York Academy of Medicine; Dr. Harold F. Dorn, Public Health Service; Dr. Edwin F. Daily, Children's Bureau; Dr. Paul M. Densen, Veterans Administration; Dr. W. Thurber Fales, Baltimore City Health Department; Dr. E. L. Hamilton, Office of the Surgeon General, U. S. Army; Dr. I. M. Moriyama, Public Health Service; Dr. Edward S. Rogers, School of Public Health, University of California (also Chairman A.P.H.A. Subcommittee for the Sixth Revision of the International List of Causes of Death); and Captain R. L. Ware, Bureau of Medicine and Surgery, Navy Department.

WISCONSIN PUBLIC HEALTH COUNCIL

On May 12, in Madison, Wis., a group of 45 persons calling itself "just a youngster," organized formally as the Wisconsin Public Health Council. The group was made up of 14 members at large and representative of 25 organizations—professional societies, farm and labor groups, voluntary health agencies, women's groups, and others.

It discussed the purposes of the new organization, the type of membership and program suited to the purposes, selected a constitution and nominating committees, named itself, and heard from Carl Neupert, M.D., State Health Officer, Allan Filek, M.D., Director of Local Health Administration in the State Department of Health, and Carl E. Buck, Dr.P.H., of the Michigan University School of Public Health.

At a second meeting on July 15, a constitution and by-laws were adopted and the following officers elected:

President—Richard Bardwell, Madison
1st Vice-President—William J. Deegan, Superior
2nd Vice-President—Mrs. Oliver Plantinga, Rothschild
Treasurer—Mrs. A. W. Hammond, Beaver Dam

Gertrude Clouse, Consultant Nurse of the State Health Department, has been released to serve as full-time Secretary of the Council.

Committees on membership, program, constitution and by-laws, publications and education, and public relations were appointed. One of the early programs being planned is the development of community health councils in many areas of the state.

The constitution provides for a broad membership representing all citizen interests. The Council is not an official arm of the State Health De-

partment or any other branch of the Wisconsin government.

Carl N. Neupert, M.D., State Health Officer, addressed the July 15 group on "The Most Urgent Public Health Needs in Wisconsin." He pointed out the lack of local full-time health services in large parts of the state, the need for citizen support of the health department's planning in this field, and the importance of supporting the federal Public Health Services Bill of 1948, which would provide federal grants-in-aid for general community health services, and the need for consolidating some 2,000 health jurisdictions in the state into a few large units with populations of at least 50,000.

NEWS IN THE NEW YORK CITY HEALTH DEPARTMENT

Harry S. Mustard, M.D., on leave from the directorship of the Columbia University School of Public Health, became Health Commissioner of New York City's 8,000,000 people nearly a year ago. He has now announced a number of developments.

One is the reorganization of the 19 different units of the department into 5 major divisions, with 2 headed by deputy commissioners. The 5 divisions and the commissioners heading them, all of whom are career men in the department, are:

Community Health Services—Deputy Commissioner, Samuel Frant, M.D.
Administrative Division—Deputy Commissioner, Matthew A. Byrne
Preventable Diseases and Adult Hygiene Services—Assistant Commissioner, Ralph S. Muckenfuss, M.D.
Maternal and Child Health Services—Assistant Commissioner, Leona Baumgartner, M.D.
Environmental Sanitation Services—Assistant Commissioner, Jerome Trichter

Dr. Frant, who has been with the department since 1923, most recently as Director of the Bureau of Preventable Diseases and Deputy Commissioner, will also serve as Commissioner during the latter's absence. He will coördinate the activities of the various divisions and assign professional personnel, in addition to heading his own Division of Community Health Services which includes District Health Administration, Public Health Nursing, Nutrition, and Public Health Education.

Dr. Muckenfuss has been with the department since 1935, since 1937 as Director of the Bureau of Laboratories. As Assistant Commissioner he will supervise not only the Bureau of Laboratories, but those of Preventable Diseases, Tuberculosis, Social Hygiene, and Adult Hygiene.

Dr. Baumgartner has been Director of the Bureau of Child Hygiene since 1941, having first joined the department in 1937. She will direct the work of 4 bureaus: Mothers and Young Children, Physically Handicapped Children, Dentistry, and School Health.

Mr. Trichter has been Director of the department's Bureau of Food and Drugs since 1939, and first joined the department in 1930. He will be in charge of 2 bureaus: Food and Drugs and Sanitary Engineering.

Coincident with this reorganization, details were announced of plans for a new diagnostic and periodic health examination service. A first "pilot clinic" is in the planning stage, to be opened in the near future. The diagnostic service will be open to patients referred by their private physicians to whom they will be referred back for treatment. The periodic health examination service will be for persons referred by private physicians and persons from groups selected for such study by the department.

In announcing this service, Dr. Mustard pointed out that the department has already had a long tradition of making diagnostic services available to private physicians, chest x-rays, tropical disease and venereal disease services, laboratory services and diagnostic

services in communicable diseases, the latter two having been provided for half a century. Said Dr. Mustard further, "The new diagnostic service program is being put into operation because, as medical knowledge has progressed, specialized information, skills, and equipment have become increasingly necessary if patients are to receive the full benefits of modern medicine. These things are expensive. Too frequently when the private physician orders specialized examinations, x-rays, and tests, the family of ordinary means is unable to obtain them because of the cost."

INTERNATIONAL POLIOMYELITIS CONFERENCE TO HAVE PERMANENT STATUS

At the final session of the International Poliomyelitis Conference in New York on July 17, an Organization Committee was created to form a permanent body for a global study of poliomyelitis. This committee of 15 is made up of the President and Medical Director of the National Foundation for Infantile Paralysis, the 7 members of the Advisory Committee of the International Conference, its Executive Secretary, and representatives of 5 nations other than the United States.

The committee list follows:

Irvin Abell, M.D., Clinical Professor Emeritus of Surgery, University of Louisville, Louisville, Ky.

Fritz Buchthal, M.D., Director, Institute of Neurophysiology, University of Copenhagen, Denmark

Oswaldo P. Campos, M.D., Hospital Jesus, Rio de Janeiro, Brazil

Morris Fishbein, M.D., Editor of *The Journal of the American Medical Association*, Chicago, Ill.

Stanley E. Henwood, Executive Secretary, First International Poliomyelitis Conference

David Lloyd, Ph.D., Associate Member of the Rockefeller Institute for Medical Research, New York, N. Y.

Kenneth Maxcy, M.D., Professor of Epidemiology, The Johns Hopkins University, Baltimore, Md.

Rustin McIntosh, M.D., Professor of Pediatrics, Columbia University, New York, N. Y.

Frank Ober, M.D., Professor Emeritus of Orthopedic Surgery, Harvard University, Boston, Mass.

Basil O'Connor, President, The National Foundation for Infantile Paralysis.

Thomas Rivers, M.D., Director of The Hospital of the Rockefeller Institute for Medical Research, New York, N. Y.

Hernan Romero, M.D., Professor, Hygiene and Preventive Medicine, University of Chile, Santiago

Professor Herbert J. Seddon, Medical Director, Wingfield-Morris Orthopaedic Hospital, Oxford, England

Professor Dr. S. Van Creveld, of Pediatric Clinic, University of Amsterdam, The Netherlands

Hart E. Van Riper, M.D., Medical Director, The National Foundation for Infantile Paralysis

The Executive Committee of this group is made up of Drs. Fishbein, Maxcy, McIntosh, Rivers, and Van Riper.

The resolution creating the Organization Committee empowers it to adopt by-laws for the international congress, secure a charter under the laws of New York State, and fix the place and date of the first formal international congress to be held in 1951.

IS THIS A TREND?

The Hartford (Conn.) Health Department is developing a medical-social service with headquarters in its clinic building. Financed for the first year by the Hartford Foundation for Public Giving, its purpose is to assist patients and their families with social problems incident to their illness. In addition to working closely with other health department bureaus, the service accepts referrals from other city departments, social agencies, industrial nurses and physicians, and the patient himself or his family. Service to private physicians is of two types: (a) Consultative services giving information about sources of help either to the physician or his patient; (b) Intensive service to

the patient including an interview by the staff worker.

The announcement further says, "Occasionally persons who reside outside of the city limits, if they cannot be cared for in any other way, may be referred by local agencies, doctors, and firms since many of the agencies with whom the social worker is in contact serve an area larger than the city."

The Director of the new service is Barbara A. Wells, graduate of the Simmons College School of Social Work, and formerly with the Hartford Hospital, the Greater Hartford Community Council, and the American Red Cross Overseas Service.

COLLEGE SORORITIES HELP CEREBRAL PALSIED

The National Society for Crippled Children and Adults has awarded scholarships to 8 persons for specialized training in cerebral palsy. This program is made possible by a national women's college sorority, Alpha Chi Omega, which has adopted help to the cerebral palsied as its major national service project. It has made available to the National Society for Crippled annually for 6 years, $5,000 to support the program of cerebral palsied training scholarships. The first 8 scholarships went to 4 physical therapists and 4 physicians.

Simultaneous with this news is the further announcement that another national women's sorority, Zeta Tau Alpha, at its recent Golden Anniversary Convention, made a grant of $10,000 to the National Society for compiling and publishing an equipment brochure for the treatment of palsied children. This is in addition to an initial grant of $2,500 the previous year for preliminary work on the brochure.

CONTROL OF LEAD EXPOSURE

Three aspects of the control of lead exposure are presented in a 21 page pamphlet published by the Lead Industries Association. They are: "A Medical View of the Lead Problem," by William C. Wilentz, M.D., Medical Director of the Perth Amboy plant of the National Lead Company; "Medical and Hygiene Aspects of Plant Lead Control," by Lloyd E. Hamlin, M.D., Medical Director, American Brake Shoe Company; and "Lead Hygiene in the Plant—The Industrial Hygiene Aspect," by Herbert J. Weber, Industrial Hygienist, also of the American Brake Shoe Company. Lead Industries Association, 420 Lexington Avenue, New York 17, N. Y., 50 cents.

MANUAL OF SAFETY IN SANDBLASTING

The Industrial Hygiene Foundation of America, Inc., has prepared for the National Industrial Sand Association a manual entitled *Safety in Sandblasting*. The manual offers helpful hints concerning sandblasting operations. It includes brief descriptions of the processes, equipment, points of safety, and protective equipment desirable in sandblasting operations. Available from the N.I.S.A., Washington, D. C., $1.00.

WINTHROP-STEARNS NAVY CITATION FOR WAR WORK

Award of a certificate of achievement to Winthrop-Stearns, Inc., manufacturer of pharmaceuticals, was made in New York on July 15 by the Surgeon General, U. S. Navy, in recognition of "meritorious and outstanding services rendered to the Navy's Medical Department during World War II." In presenting the certificate to Theodore G. Klumpp, M.D., President of Winthrop-Stearns, Rear Admiral A. H. Dearing, District Medical Officer, said in part, "exceptionally outstanding cooperation and assistance voluntarily rendered by your organization to the Materiel Division, Bureau of Medicine and Surgery, throughout the war period . . . were of inestimable value to the

Bureau, and enabled it to maintain at all times a high degree of proficiency in keeping a constant flow of essential material and equipment to the Medical Department in all parts of the world."

During the war Winthrop-Stearns produced antimalarials and other drugs used in the treatment of such tropical diseases as African sleeping sickness, kala-azar, filariasis, and schistosomiasis. The firm discovered a method of producing atabrine on a commercial scale early in the war, and developed aralen, an antimalarial considered more potent than atabrine or quinine by the National Research Council.

WATER POLLUTION BILL PASSED

The water pollution bill (S. 418) has been signed by the President. Its purpose is to establish a national program for eliminating or reducing pollution of interstate waters while at the same time recognizing and preserving the primary responsibilities and rights of the states in controlling water pollution. The U. S. Public Health Service is made responsible for the preparation of comprehensive programs plus specified regulatory activities. The bill authorizes the expenditure of $1,000,000 a year for 5 years for grants to states to support investigations on ways to prevent and control pollution by industrial wastes; another $1,000,000 a year for 5 years to assist public bodies in making needed studies preliminary to construction projects; and $22,500,000 a year for 5 years as loans to help finance construction of necessary treatment works.

HOWARD M. KLINE TO HOOVER COMMISSION

Howard M. Kline, Ph.D., has been appointed Executive Secretary of the Medical and Hospital Services Committee of the Hoover Commission, which is studying reorganization of the United States Government's executive branch. This committee, whose chairman is Tracy S. Voorhees, Under-Secretary of War, and President of Long Island College Hospital, Brooklyn, N. Y., has established an office in Washington with a full-time executive.

Dr. Kline has been Technical Secretary of the A.P.H.A. Subcommittee on Medical Care since its Washington office was established in 1946. He was on leave of absence in the spring of 1948 to serve as General Secretary of the National Health Assembly held in Washington in May.

Among recent appointments to the Medical and Hospital Services Committee is Hugh Leavell, M.D., Professor of Public Health, Harvard School of Public Health. Dr. Leavell was chairman of the controversial Medical Care Section of the National Health Assembly.

RESEARCH INSTITUTION IN NATIONAL INSTITUTES OF HEALTH

A new clinical research institution for the National Institutes of Health of the U. S. Public Health Service is now in the pre-construction stage and is expected to be ready for use by midsummer of 1951. Bids were invited in July for this 13 story building that will have a floor space of approximately 1¼ million square feet.

It will house the National Institute of Mental Health, including 150 beds for neuropsychiatric patients, as well as the hospital facilities of the National Cancer Institute, National Heart Institute, and National Institute of Dental Research, and clinical services for the study of patients with infectious and tropical diseases.

Although the institution will contain 500 hospital beds and receive patients referred from all parts of the country, scientific laboratories will occupy two-thirds of the building. In one wing new products arising out of atomic energy researches and highly complex machines

will be used to treat certain types of tumors and to study body functions in health and disease.

Medical and psychiatric social service, physical and occupational therapy, and rehabilitation services will be provided in addition to the conventional services of a general hospital.

In announcing the details for the new Clinical Center in Bethesda, Md., R. E. Dyer, M.D., Director of the National Institutes of Health, said, "By an unusual combination of laboratory facilities to aid physicians in diagnosis and treatment, this Center will make possible a unified, planned attack upon some of our most baffling medical problems and will also assure patients of the very highest quality of medical care. Major emphasis will be placed on the predominant causes of death and disability in our nation today.

"The building is designed to enable physicians, chemists, physicists, bacteriologists, sociologists, psychologists, and other scientists to work in close collaboration. Using the team technique which has already produced notable research discoveries, they will be able to pursue every ramification of the diseases they study."

POSTGRADUATE SEMINARS AT COLORADO UNIVERSITY

The University of Colorado School of Medicine, at its Medical Center in Denver, will hold two short seminars on subjects of interest to public health physicians. One, in coöperation with the State Health Department on problems of new-born infants, both premature and full term, will be held October 14–16. Registration fee is $10.

The second, on public health and preventive medicine, will be held October 18–21. It is designed to give the general practitioner, particularly in rural areas, the fundamentals of communicable disease control through sanitation, immunization, and other procedures. Coöperating agencies are the Colorado State Medical Society, the Department of Public Health, and the U. S. Public Health Service.

Apply University of Colorado Medical Center, 4200 East 9th Avenue, Denver 7.

LOS ANGELES COUNTY HEALTH INDEX

The Los Angeles County Health Index for December 27, 1947, and July 10, 1948, contains interesting tabulations of tuberculosis statistics, which remind us that this disease causes 20 per cent of all deaths in the 30–40 age group; and that the potential years of life lost by those who died from tuberculosis in the United States in 1944 was 1,175,000, as compared with 1,287,245 from cancer and 1,929,953 from heart disease.

The second article calls attention to the marked excess of mortality among males as compared with mortality among females at the older age periods —a problem discussed in the August issue of this *Journal*.

REORGANIZATION FOR NEW JERSEY

On June 7, 1948, the Public Health Council of New Jersey unanimously approved a plan for the functional reorganization of the New Jersey State Department of Health presented by the new Commissioner, Daniel J. Bergsma, M.D.

Under this plan the activities of the department will be carried on through six main bureaus, each under the leadership of a director qualified for the specific responsibility involved. The bureaus are: Environmental Sanitation, Preventable Diseases, Laboratories, Local Health Services, Vital Statistics and Administration, and Constructive Health. The last named will be specifically responsible for the development of plans that can be applied locally to

increase the good health of the community. It will include the state department's activities in the field of nutrition, public health nursing, maternal and child health, adult health and health education.

MEDICAL ADVISORY COMMITTEE TO RESOURCES BOARD

The chairman of the National Security Resources Board, Arthur M. Hill, recently announced appointment of a Medical Advisory Committee to consult with the Board on security aspects of public health. The committee members are William P. Shepard, M.D., in charge of the Metropolitan Life Insurance Company's health and welfare activities in the western part of the United States; A. C. Bachmeyer, M.D., Director of the University Clinics and Hospital, University of Chicago; James C. Sargent, M.D., Chairman of a permanent council of the American Medical Association, set up to deal with problems of national emergency; Edward L. Bortz, M.D., Associate Professor of Medicine, University of Pennsylvania and recent President of the American Medical Association; Michael E. DeBakey, M.D., Assistant Professor of Surgery, Louisiana State University; and Percy T. Phillips, D.D.S., Secretary, New York Dental Society.

PERSONALS

E. J. ADE has been appointed Fund-Raising Director of the American Heart Association, New York City. Formerly associated with the John Price Jones Corporation, Mr. Ade has directed fund-raising activities for the Planned Parenthood Federation of America and the New York University-Bellevue Medical Center.

JAMES R. AMOS, M.D.,† formerly Health Officer of Greene County, Missouri, has become Medical Director of a regional blood donor service of the American Red Cross, covering 28 Missouri counties. With headquarters in Springfield, a "bloodmobile" will make regular visits to all communities within a 100 mile radius. This is said to be the second community in the Midwest and the first in Missouri to establish a regional blood service program.

JOSEPH C. ANDERSON, M.D., in March, was appointed District Medical Director for the Pennsylvania Department of Health in Cambria and Somerset Counties with headquarters in Ebensburg.

FRANK C. BAUER† has been appointed Chief of the newly organized Public Health Methods Division which will collect and analyze Chicago Health Department birth, death, and disease statistics. Mr. Bauer was Chief of the Import Statistics Section of the Bureau of the Census in Washington from 1942 through 1947.

W. A. BROWN, M.D., became City-County Director of Health of Evansville, Indiana. He was formerly Director of the Bureau of Communicable Diseases, Virginia Department of Health.

LEROY E. BURNEY, M.D.,* Indiana State Health Officer, recently received the 1948 Good Governmental Award of the Indiana Junior Chamber of Commerce, in the form of a glass plaque. This is given annually for the outstanding young man (under 35) of the year.

H. D. CROW, M.D.,† who has just completed the work for the degree of Master of Public Health at Johns Hopkins School of Public Health, Baltimore, Md., has been appointed Health Director of the Fredericksburg City-King George, and Stafford

* Fellow A.P.H.A.
† Member A.P.H.A.

Counties Health District in Virginia.

IRENE M. DONOVAN, R.N.,* Director of the Division of Public Health Nursing, North Dakota State Department of Health, since 1939, resigned her position with the Department effective August 1.

LYNDE FALES recently joined the staff of the Alaska Department of Health. She was previously employed in the Visual Aids Section of the U. S. Office of Education, Washington, D. C., and had also been with the Washington Office of the London Daily Express, the British Information Service in New York City, and the American Embassy in France.

BEN FISHER, M.D., Milwaukee, Wis., has been named the winner of University of Illinois Borden Undergraduate Award for 1948, a gift of $500, for research in "Clinical Observations on the Prothrombin Test."

CHANGES IN FLORIDA HEALTH OFFICERS:

BURTON F. AUSTIN, M.D.,† is now Health Officer of the Palm Beach County Health Department with headquarters at West Palm Beach. Dr. Austin was formerly State Health Officer of Alabama and Regional Medical Director of the American Red Cross. The Assistant Health Officer is CHARLES G. CHAPLIN, M.D., formerly Health Officer of the Jefferson County Health Department.

JOSEPH H. BATSCHE, M.D., has been employed as Assistant Director at the Rapid Treatment Center at Melbourne.

G. L. BEAUMONT, M.D., of New Cumberland, W. Va., is now Health Officer of Highlands, Glades, and Hendry Counties, with headquarters at Sebring, succeeding E. W. HOLLINGSWORTH, M.D.

HOLLAND M. CARTER, M.D., of Smoaks, S. C., has been elected Health Officer of the Madison and Taylor County health unit with headquarters at Madison. He succeeds ROBERT F. SAYRE, M.D., resigned.

RAYMOND J. DALTON, M.D.,† resigned as Health Officer of the Lake County Health Department, effective August 1.

JAMES W. FERRIS, M.D., formerly Health Officer of Putnam and Flagler Counties has been elected Health Officer of Hardee, DeSoto, and Charlotte Counties, with headquarters at Arcadia. He succeeds DANIEL H. ROWE, M.D., who has resigned to become House Officer at the Boston City Hospital, Boston, Mass.

ALBERT O. RYAN, M.D., has been appointed Assistant Health Officer to EDWIN G. RILEY, M.D.,† in the Polk County Health Department with headquarters in Bartow.

WILLIAM W. FRYE, M.D.,* has been appointed Professor of Tropical Medicine and Public Health and Assistant Director of the Division of Graduate Medicine, Tulane University, New Orleans, La. Since 1945 he has been Professor and Head of the Department of Preventive Medicine and Public Health, Vanderbilt University, Nashville, Tenn.

TINSLEY R. HARRISON, M.D., Professor of Medicine at Southwestern Medical College, Dallas, Tex., became President of the American Heart Association at its annual meeting in Chicago, June 18–19, succeeding ARLIE R. BARNES, M.D., Rochester, Minn. HAROLD M. MARVIN, M.D., New Haven, Conn., former Executive Secretary of the Association, was chosen President-Elect.

HENRIETTA HERBOLSHEIMER, M.D.,† has been appointed Medical Administrative Assistant to ROLAND R. CROSS, M.D.,† Director of the Illinois Department of Public Health. A member of the staff of the department for 7 years, she has been Chief

of the Division of Hospital Construction and Services for the past year, and earlier Chief of the Division of Maternal and Child Health. She has been succeeded as Chief of the Division of Hospital Construction and Services by GEORGE K. HENDRIX,† who has been in the Department since 1937, first in the Division of Sanitary Engineering and later in the Division of Hospital Construction and Services.

HAZEL HIGBEE,† former Professor of Public Health Nursing at the Medical College of Virginia, has succeeded MARY I. MASTIN * as Director of the Bureau of Public Health Nursing, Virginia Department of Health, Richmond.

JOHN P. HUBBARD, M.D.,† has been appointed Assistant Professor of Pediatrics at the University of Pennsylvania, School of Medicine, where he will direct a rheumatic fever teaching program throughout Pennsylvania under the auspices of the State Health Department. He will simultaneously direct a nation-wide program of the American Academy of Pediatrics for the improvement of child health from offices in the hospital. He has been directing a study of child health services for the Academy.

BURTON K. KILBOURNE, M.D.,* was recently reëlected for a two year term as Secretary and Executive Officer of the Montana State Board of Health, Helena.

JOHN H. KLOPP, M.D.,† has been appointed State Medical Director of Delaware County, Pennsylvania. He will supervise local health programs, control of communicable diseases, and health activities in fourth class school districts.

DAVID B. LEE,* Chief Sanitary Engineer, Florida State Board of Health, Jacksonville, recently received the Kenneth Allen Award for outstanding service to the state and national Sewage Works Associations. The award is presented every 3 years by the state chapter of the Federation of Sewage Works Association.

KATHARINE F. LENROOT,* Chief of the Children's Bureau of the U. S. Federal Security Agency, delivered the 1948 commencement address at Tulane University, New Orleans, which conferred upon her the honorary degree of Doctor of Laws. Three days earlier Russell Sage College, Troy, N. Y., conferred the honorary degree of Doctor of Humane Letters upon Miss Lenroot at its commencement on May 30.

ESTELLE MARKS,† who has been Acting Registrar for some time, was recently appointed Virginia Registrar of Vital Statistics, Richmond.

HARLAN P. MCNUTT, M.D., M.P.H., who has just received the M.P.H. degree from Johns Hopkins School of Public Health, has been appointed Director of the Oregon State Board of Health's Mental Hygiene Section, effective August 1. He served as neuropsychiatrist with the U. S. Veterans' Administration in Portland in 1946–1947, and served in a similar capacity with the U. S. Army Medical Corps from 1944 to 1946.

ORLO MILLER † has been appointed to the newly established position of School Health Coördinator in the Wisconsin State Department of Public Instruction, Madison. Mr. Miller formerly worked on a state-wide school program of health and physical education in Indiana.

ROBERT R. MORGAN, M.D., has been appointed Associate Professor of Epidemiology at the School of Public Health, University of Michigan, Ann Arbor. Dr. Morgan has recently been working at the Thorndike

---

* Fellow A.P.H.A.
† Member A.P.H.A.

Memorial Laboratory in Boston as Senior Fellow in Virus Diseases, National Research Council, in investigations concerned with Salmonella and chemotherapy of virus infections.

ELDRED K. MUSSON, M.D.,* on July 15 began his duties as Peoria, Ill., City Health Officer. He was formerly Health Officer of Schoharie County, New York.

JOHN W. R. NORTON, M.D.,* was elected North Carolina State Health Officer by the State Board of Health. He succeeds CARL V. REYNOLDS,* retired June 30. Since 1940 Dr. Norton has been with the Tennessee Valley Authority at Chattanooga, Tenn. Previously he was Assistant Director of county health work and later Assistant Director of Preventive Medicine in the North Carolina State Health Department.

NETTIE PRICE, R.N., has accepted a position as Coördinator for County Hospitals and the County Health Department, Monongalia County, West Virginia. Coming most recently from the Brooklyn, N. Y., Visiting Nurse Association, Miss Price has a varied background of journalism, social work and statistical research, and public health nursing.

MORTON M. RAYMAN, M.D., has been appointed Chief of the Microbiological Branch of the Food Research Division, Quartermaster Food and Container Institute for the Armed Forces, Chicago. He will direct research concerning the nature and factors affecting the microbiological and histological changes which occur during the processing and storage of foods for the use of the Armed Forces.

PHYLLIS RING, R.N., public health nurse, has joined the staff of the Alaska Department of Health, Juneau, having previously been in the Minneapolis Community Health Service.

PHILIP C. RISSER, M.D., of Blackwell, Okla., has been appointed Medical Health Officer for the Olympia Peninsula Health District of Washington, including Clallam and Jefferson Counties and with headquarters in Port Angeles. He succeeds SHIRLEY BENHAM, JR., M.D.,† who has been appointed District Health Officer for the Kitsap County-City of Bremerton Health Department.

L. J. ROPER, M.D.,* was recently reappointed to a new 4 year term as Virginia Health Commissioner by GOVERNOR TUCK.

W. H. RUMBEL, D.D.S.,* is the new Director of the Division of Mouth Hygiene, Virginia Department of Health. He was most recently Director of the Bureau of Dental Hygiene, West Virginia Department of Health.

JAMES G. SHAFFER, D.Sc.,† Assistant Professor of Preventive Medicine and Public Health at Vanderbilt University School of Medicine, Nashville, Tenn., has resigned, effective July 1, to become Associate Professor of Bacteriology and Virology, and Associate in Preventive Medicine at the University of Louisville School of Medicine, Ky.

ROBERT E. SHANK, M.D.,† has been appointed Professor of Preventive Medicine and Public Health of the Department of Preventive Medicine and Public Health at the Washington University School of Medicine, St. Louis, Mo., effective July 1. Dr. Shank was previously with the William H. Park Laboratories in New York.

MARGARET T. SHAY, R.N., has been appointed Director of the Adelphi College School of Nursing, Garden City, N. Y. She was most recently Associate Professor of Nursing, Wayne University, Detroit, Mich.

---

* Fellow A.P.H.A.
† Member A.P.H.A.

JAMES W. SMITH has been named Director of the Virginia Health Department's new Division of Tourist Establishment Sanitation in the Bureau of Local Health Services. He has been in the Department of Health since 1921, most recently as Supervisor of Sanitation in the Richmond office.

JOSEPH EARL SNYDER, M.D., was recently named Director of Vanderbilt Clinic and Administrative Assistant in charge of Professional Services to Patients by the Executive Committee of the Board of Trustees of the Presbyterian Hospital, New York, N. Y.

SAMUEL D. STURKIE, M.D., M.P.H.,† has resigned as Health Officer of Lynchburg, Va., to become the Director of the Charlottesville-Albemarle County Health Department in the same state.

SIDNEY I. WOLFSON† has resigned as Health Officer of Dover, N. J., to accept the position of Public Health Administrator in the Montgomery County, Maryland, Health Department.

G. W. WYATT, D.D.S., has been named Director of the Bureau of Dental Health, West Virginia State Department of Health, Charleston, succeeding W. R. RUMBEL, D.D.S.,† resigned. Dr. Wyatt has been field clinician and later Assistant Director of the Division.

FRANKLIN D. YODER, M.D., M.P.H.,† has been appointed Director of the Wyoming State Department of Health, Cheyenne, effective August 1.

Deaths

TALIAFERRO CLARK, M.D., former Assistant Surgeon General of the U. S. Public Health Service, died July 4 in the U. S. Marine Hospital, Ellis Island, N. Y., at the age of 81. As Assistant Surgeon General, Dr. Clark served as Chief of the Venereal Disease Division from 1930 to 1933.

RICHARD PEARSON STRONG, M.D., authority on tropical diseases and epidemics, died on July 4 at the age of 76. Dr. Strong's research took him to all parts of the world and he was decorated for his achievements by Britain, France, China, and Serbia. In 1946 he won the Legion of Merit for his work in World War II. The Theobald Smith medal of the American Academy of Tropical Medicine was bestowed on him in 1939. The first Richard Pearson Strong medal for distinguished achievement in tropical medicine was presented by the American Foundation for Tropical Medicine, February, 1944, to Dr. Strong for whom the medal was named.

CONFERENCES AND DATES

American Dietetic Association. Boston, Mass. October 18–22.

American Public Health Association—76th Annual Meeting. Boston, Mass. November 8–12.

American Public Welfare Association. Chicago, Ill. December 9–10.

American Public Works Association. Boston, Mass. October 17–20.

American Society of Planning Officials. New York, N. Y. October 11–13.

American Water Works Association:

- Alabama-Mississippi Section. Montgomery, Ala. October 13–15.
- Arizona Section. Phoenix, Ariz. October 15–16.
- California Section. San Francisco, Calif. October 27–29.
- Florida Section. Panama City, Fla. November 18–20.
- Iowa Section. Fort Dodge, Iowa. October 5–6.
- Joint Meeting of Four States and Western Pennsylvania Sections. Philadelphia, Pa. October 20–22.
- Missouri Section. Jefferson City, Mo. October 24–26.
- New Jersey Section. Atlantic City, N. J. November 4–6.
- North Carolina Section. Asheville, N. C. November 8–10.

Ohio Section. Mansfield, Ohio. October 7–8.

Southeastern Section. Augusta, Ga. December 6–8.

Southwest Section. Galveston, Tex. October 10–13.

Virginia Section. Richmond, Va. October 25–26.

Wisconsin Section. La Crosse, Wis. October 28–29.

Civil Service Assembly of the United States and Canada. Ottawa, Canada. October 4–7.

College Physical Education Association. 52nd Annual Convention. Hotel La Salle, Chicago, Ill. December 27–28.

Florida Public Health Association. Dixie Sherman Hotel, Panama City, Fla. October 7–9.

Michigan Public Health Association. Grand Rapids, Mich. December 1–3.

National Association of Housing Officials. Seattle, Wash. October 13–16.

National Pest Control Association. Royal York Hotel, Toronto, Canada. October 18–20.

National Safety Council. Stevens Hotel, Chicago, Ill. October 18–22.

North Dakota Public Health Association. Minot, N. D. October 28–29.

Southern Branch, American Public Health Association. Baker Hotel, Dallas, Tex. April 14–16, 1949.

WANTED

Virologist—or Bacteriologist Ph.D.

Preferably with production experience to head developmental research section. Send personal Data and references in answering.

Write Mr. M. C. Bloom
E. R. SQUIBB & SONS, NEW BRUNSWICK, N. J.

Publications of the A.P.H.A.

An Appraisal Method for Measuring the Quality of Housing: A Yardstick for Health Officers, Housing Officials and Planners. Part I. Nature and Uses of the Method. 1945. 71 pp. $1.00.

A.P.H.A.-Year Book 1947–1948. 112 pp. $1.00.

Part II. Appraisal of Dwelling Conditions. Director's Manual; Field Procedures; Office Procedure (1946). $5.00.

Basic Principles of Healthful Housing. 2nd ed. rev. 1946. Report of the Committee on the Hygiene of Housing. 34 pp. $.40.

Control of Communicable Diseases, The. 6th ed., 1945. Size 4¼" x 7¼". 149 pp. $.35.

Diagnostic Procedures and Reagents. Technics for the Laboratory Diagnosis and Control of the Communicable Diseases. 2nd ed., 1945. $4.00.

Diagnostic Procedures for Virus and Rickettsial Diseases. 1948. 347 pp. $4.00.

Health Practice Indices, 1943–1946. A collection of charts showing the range of accomplishment in various fields of community health service, 1947. 77 pp. Free.

Membership Directory. 1946. (Free to A.P.H.A. members). $5.00.

Methods for Determining Lead in Air and in Biological Materials. 1944. 41 pp. $.75.

Occupational Lead Exposure and Lead Poisoning. 1943. 67 pp. $.75.

Panum on Measles. By P. L. Panum (translation from the Danish). Delta Omega ed., 1940. 111 pp. $2.50.

Photographic Sediment Chart, 1947 ed., $1.50.

Planning the Neighborhood. Committee on the Hygiene of Housing, 1948. 89 pp. $2.50.

Proceedings of the National Conference on Local Health Units. Supplement to A.J.P.H., Jan. 1947. 160 pp. Covered, $1.00.

Proceedings of the Princeton Conference on Local Health Units, September 1947. $.50.

Public Health: A Career with a Future. Rev. ed. 1948. $.15.

Public Health in Midstream. Papers presented at the Special Sessions at Atlantic City. Supplement to A.J.P.H., Jan. 1948. $1.00.

Shellfish and Shellfish Waters, Recommended Methods of Procedure for Bacteriological Examination of. 1947. 12 pp. $.25.

Spanish Summary of 8th edition (1941) of Standard Methods for the Examination of Dairy Products, 1945. 52 pp. Free to Latin American countries. $.10 in the United States.

Standard Methods for the Examination of Dairy Products, 9th ed., 1948. 373 pp. $4.00.

Standard Methods for the Examination of Water and Sewage. 9th ed., 1946. 286 pp. $4.00.
Physical and chemical examination of water and sewage, microscopical examination of water and bacteriological examination of water.

Survey Form for Milk Laboratories. Indicating Conformity with Standard Methods for the Examination of Dairy Products (8th ed.). May, 1944. Single copies 10c; 50 copies $1.00; 100 copies $1.50; 1,000 copies $10.00.

Swimming Pools and Other Public Bathing Places, Recommended Practice for Design, Equipment and Operation of. 1942. 56 pp. $.50.

Vital Statistics Directory. Compiled by the Vital Statistics Section. 3d ed., 1945. $.75.

Check above the publications desired and mail this advertisement to us, together with your remittance to cover (check, money order, or stamps). Members of the Association are entitled to 10% discount on the above.

Name.....Address.....

Order from the Book Service

AMERICAN PUBLIC HEALTH ASSOCIATION
1790 Broadway at 58th Street New York 19, N. Y.